Characteristics of forest-based recreational user groups:

An analysis of data in support of the 1998 Wisconsin statewide comprehensive outdoor recreation planning process

Collaborative research between the Wisconsin Department of Natural Resources and the University of Wisconsin - Madison/Extension

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EXECUTIVE SUMMARY

The Statewide Comprehensive Outdoor Recreation Planning (SCORP) process currently underway within the Wisconsin Department of Natural Resources requires detailed data on specific recreational uses. The research reported in this publication represents analysis of a 1996 survey-based dataset gathered from over 1,000 forest-based recreationists in Wisconsin. The analysis was directed to meet two primary objectives. These included (1) presenting a descriptive analysis of 12 forest-based recreational user groups in Wisconsin, including their spatial and temporal preferences, their recreational needs, and their satisfaction with the resource and (2) identifying compatibility issues between forest management and recreational activities.

The survey results suggest that there exists wide variation among user groups in numerous characteristics relevant to outdoor recreation in Wisconsin. These characteristics included group preferences and levels of satisfaction with outdoor recreation opportunities present throughout Wisconsin, levels of inter- and intra-use compatibility, and measures of local economic integration such as expenditure patterns. These results are useful for policy makers and resource professionals in recreation management planning. The issues that were found needing the most management attention across user groups, namely trespass concerns and crowding, are complex and require careful examination. Crowding concerns are likely to increase in areas where recreation demand is growing. A continuing challenge exists in forecasting future recreational trends and developing pro-active policies to alleviate future recreational use conflicts. Additionally, the development of consistent measures of crowding on recreation lands and a more thorough assessment of the relationship between local communities and recreational user groups require further examination.

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INTRODUCTION

As demands for various uses of public land increase, land managers must carefully balance the impacts of alternative resource use decisions. It is often the case that land managers seek to provide several outputs simultaneously. For example, land managed for timber production is also managed to provide habitat for specific animals. These animal populations, in turn, provide recreational hunting opportunities. By meeting the demand for timber while increasing wildlife habitat and the recreational opportunities for hunters, land managers may also increase the amount of economic activity generated by public lands. These practices, however, may reduce the potential of the same land to be enjoyed by passive recreational users valuing scenic beauty and natural appearance over the presence of game animals.

To best provide for multiple uses, land managers may benefit from a better method of determining demand for outputs. For market based outputs such as timber, the process is well established and generally accepted. For less direct outputs, such as recreation, the ability to gauge demand levels and user satisfaction is more complex. Without information describing the needs of various recreation groups, land managers may have a difficult time prioritizing resource enhancement activities and forecasting future demand.

In Wisconsin, public forests managed by the state are directed to ensure that sustainable forestry practices are utilized to provide a full range of benefits to present and future generations. These benefits include “soil protection, public hunting, protection of water quality, production of recurring forest products, outdoor recreation, native biological diversity, aquatic and terrestrial wildlife, and aesthetics” (Wisconsin State Statutes 28.04 (2)). State Parks, in turn, are managed for landscape preservation and recreational opportunities. Simultaneously producing these multiple benefits is a difficult challenge for land managers. This is particularly true given that some desirable benefits are, in practice, mutually exclusive. At present, there is little guidance given to assist in prioritizing outputs or assessing the relative demand for alternative outputs.

In many cases, land managers have an incomplete understanding of recreationists. Characteristics of various user groups are needed to better define the needs of recreation planning. Land managers may also lack information regarding the amount of recreation demand with which the forest is expected to accommodate. Demand levels need to be

estimated so land managers can prioritize activities and meet future recreational needs. Some recreational activities are incompatible with other types of recreation. On the other hand, some recreational activities are complimentary with, or benefited by, other uses. Levels of compatibility among recreational uses as well as compatibility between recreational activities and alternative land uses need to be identified. Forest-based activities can be timed to minimize user conflict, but forest managers may have little information describing activities which need to be separated. Seasonal use patterns need to be identified to allow for management activities to be optimally scheduled.

The recreational use of forests in Wisconsin has many off-site impacts. For example, spending by recreationists in communities surrounding recreational sites helps fuel demand for service and retail sector businesses. In this report, we identify these spending patterns but also point out additional regional impact issues that can only be addressed though additional research.

The results captured in this report represent an extension of previous work developed to better understand how alternative forest uses contribute to the development of communities throughout Wisconsin. It represents only one aspect of recreational use to be applied in the current SCORP process. The data analyzed in this paper is taken from a survey funded through the Wisconsin Department of Natural Resources, Bureau of Forestry that specifically addressed forest-based recreational activities (Marcouiller and Mace, 1998). Other recreational activities that do not fall into this category would need to be addressed through separate research.

In this report, we intend to shed some light on these issues with specific reference to the forest resources of Wisconsin. Our applied research initiative set out to address two primary objectives that included:

1. presenting a descriptive analysis of 12 forest-based recreational user groups in Wisconsin, including their spatial and temporal preferences, their recreational needs, and their satisfaction with the resource

2. identifying compatibility issues between forest management and recreational activities

To accomplish these objectives, 1996 survey data taken from over 1,000 forest-based recreational users was analyzed to identify patterns and issues. The methods used in collecting this data are presented with a discussion of compatibility and importance-performance analysis (IPA). The data, together with the IPA, are then used to describe the characteristics of the following forest-based recreation groups:

Hunting	Fishing	Cross-country Skiing
Camping	All Terrain Motor Vehicle (ATMV)	Horseback Riding
Snowmobiling	Watching Wildlife	Plant Collecting
Hiking	Off-road Biking	Pack Animal Use

The information provided by survey respondents is summarized and compared across self-selected *primary* activities to identify differences and similarities among forest-based recreational users. Detailed information regarding each user groups' specific characteristics can be found in Appendix A.

METHODS

This study is based on data that has been collected and is specific to numerous regional delineations within Wisconsin. In this section, we outline procedures used to collect and analyze the data for five sub-state regions. These regions (delineated in Figure 1) follow timber inventory units as specified by the USDA Forest Service and serve as a basis for resource planning within an assortment of public agencies.

Figure 1. Regional delineations used in this study

Assessment of Recreational Use

To assess forest-based recreational use, a three-phased approach to collect data from forest-based recreational users was conducted. These included two waves of mail surveys targeting forest-based recreationists and one comprehensive random telephone survey of Wisconsin households. Our intent was to develop data specific to those who recreate primarily within forested settings. Two waves of mail surveys used the same survey instrument. This six page instrument (sample found in Appendix B) was designed and pretested to elicit responses regarding household forest-based recreational use patterns, recreation-related expenditures, attitudes about land use compatibility, perceptions of resource management attributes, development options, and demographic characteristics.

The first wave of mail surveys targeted a random sample of hunters (from four separate hunter categories) and snowmobilers. It was administered between December of 1995 and May of 1996. The sample was randomly drawn from license holders as maintained by the Wisconsin Department of Natural Resources. One limitation of this sample was that snowmobilers included only those who licensed their machine in Wisconsin. On the other hand, all hunters who hunted in Wisconsin during 1996, regardless of their place of origin, were required to license their activity with the State.

The second wave of mail surveys targeted warm weather forest recreationists. The samples were randomly selected from state and county campground registers, interpretive centers, trail users, and a set of Wisconsin all-terrain vehicle (ATMV) license holders. One important limitation of this wave of samples dealt with the difficulty encountered in developing user population lists from which to draw samples. The ownership of resource-based recreational activity used by sample populations was more heavily focused on state and county properties. Although several user lists of privately owned resources were used, there remains some bias toward publicly owned resource use.

The mail surveys were administered using a modified Dillman technique. Initial mailings were followed up with a postcard reminder after 10 days. If there was still no response after 3 weeks, another full packet of materials was sent to the participant. This generated 700 responses from the first wave and 500 from the second wave for an overall response rate of 54 percent. The residences of nonrespondents were assessed for urban, suburban, and rural origins to determine possible bias. This was done using the original mailing label address. For this post-test, urban areas were defined as addresses from cities with population greater than 10,000. Suburban was defined as proximate to urban areas and based on a population of roughly 5,000. All other addresses were classified as rural.

Table 1. Comparison of residence between survey respondents and survey non-respondents (non-response bias check)

	Respondents		Non-respondents	
Place of Residence	# of samples	Percent	# of samples	percent
Urban	217	16.1%	385	32.0%
Suburban	376	27.9%	135	11.2%
Rural	757	56.1%	682	56.7%
Total	1,350	100.1%	1,202	99.9%

Results of this non-response assessment are summarized in Table 1 and include generally encouraging results. This is particularly true for those defined as "rural" non-respondents. Rural samples were roughly equal among respondents and non-respondents (about 56 percent of both sub-samples.) The response disparities between urban and suburban were significant. In their defense, however, the discrepancies could easily be explained by the manner in which we defined suburban and urban residences ex-poste. It is likely that many of our respondents could have confused urban with suburban because our strict definition was not provided in the original survey instrument (see Appendix B). Given the encouraging match for "rural" defined subjects in the non-response check, we are satisfied that the sample of respondents represents a non-biased sample of forest-based recreationists provided our initial sampling regime was sound. No further non-response bias or contact with non-respondents was done.

The third phase of recreational use assessment relied on a statewide telephone survey of all Wisconsin households. This telephone survey was conducted by the Wisconsin Survey Research Lab (WSRL) as part of their routine *Wisconsin Opinions* work. It was conducted between January and March of 1997 and entailed approximately two minutes of discussion with each respondent on a range of questions that elicited participation rates for several categories of forest-based recreation.

Compatibility and Importance-Performance Analysis

Given time and resource constraints, our work was limited to looking at use measures from the standpoint of forest-based recreationists. From this vantage point, both intra-use compatibility (recreational user conflicts) and inter-use compatibility (recreational versus timber production) could be assessed. Our efforts to assess compatibility took the form of detailed Likert scale responses to standardized statements posed to forest recreationists. These statements focused on compatibility with forest management activities, other recreationists, and land use regulations.

Furthermore, a set of importance / performance criteria were posed and generated information on management effectiveness as perceived by forest recreationists using a method referred to as importance-performance analysis (IPA). IPA identifies salient

qualitative features and asks respondents to rate product attributes in terms of importance and performance (Fletcher, Kaiser, and Groger 1992; Hammitt, Bixler, and Noe 1996). Importance measures the level of importance attached to an attribute by a respondent on a Likert - type 1 - 5 scale. Performance measures the level of satisfaction of a respondent with the provision of the attribute on the same 1 - 5 scale. Using a combined importance and performance measure is valuable because of the need for an indication of satisfaction that stems from a person's expectations and from his or her judgment of performance (Propst and Lime 1982; Mengak, et al. 1986)

Uysal and Howard (1991) indicate that IPA involves five steps that include: (1) development of attributes; (2) administration of a survey to measure the product or service; (3) estimation of perceived importance and performance of each attribute through the calculation of the mean importance value and the mean performance value; (4) plotting of intersect of mean importance and performance values for each attribute on a two dimensional grid; and, (5) assessment of attributes based on grid location. Our work followed this five-step procedure.

Ritchie (1987) indicates that IPA is an evaluative tool to complement policy decisions at the decision level. Evans and Chon (1989) used IPA to interpret two different tourism destinations to solve problems and resolve tourism issues. Specific to forest-based recreation, Hollenhorst and Olson (1992) and Hollenhorst, Olson and Fortney (1992) employed an importance-performance analysis of the recreation features of an Eastern National Forest. They believe recreation planners can use these IPA results in formulation of forest management plans that minimize conflict.

Our ongoing analysis is currently extending the IPA results toward development of causal models that help explain attributes that fall into the quadrant requiring management attention (high importance, low performance). Thus, IPA results can aid forest managers by identifying, in a comprehensive fashion, long-standing issues of consumer dissatisfaction. Results of this ongoing analysis are forthcoming (Marcouiller, 1998).

DESCRIPTIVE RESULTS OF THE RESEARCH PROJECT

This section summarizes the survey findings across different forest-based recreational user groups. Seven different aspects of recreation characteristics and issues are compared and contrasted among the user groups:

- Alternative uses by primary activity;
- Compatibility with other recreational uses;
- Seasonal use patterns;
- Landownership of recreational sites;
- Regional use patterns;
- Expenditure patterns;
- Importance-performance analysis.

Over 1300 surveys were received and summarized to make comparisons across user groups. Primary activity was self-selected by respondents. Only nine of the twelve activities identified in the survey received enough responses to allow meaningful interpretation. Plant collecting, pack animal use and cross-country skiing, as primary activities are not included in the summaries for this reason. Hunting was the most frequent self chosen primary activity, followed by camping and snowmobiling. This reflects the sample selection criteria and not participation rates, as hunters were over-sampled in the method used.

Initially, responses were further segregated based upon level of involvement (e.g. high, medium and low). Lower sample sizes for some activities make meaningful comparisons across primary activity and involvement level difficult. The detailed characteristics of each user group can be found in Appendix A. The summaries below represent weighted averages of the involvement categories within each user group.

Alternative Uses By Primary User Group

Survey respondents were asked to identify their primary activity as well as other activities in which they participated. The summarized averages can be seen in Table 2, which illustrates the varying amount of time users spend in their primary activities. For example, respondents who declared camping to be their primary activity spent less than one third of their recreational time in that activity. On the other end of the spectrum, wildlife watchers spent over two-thirds of their recreational days viewing wildlife. The average portion of time spent participating in the primary activity was 43%. Five of the nine activities summarized fell within 3% of this average: hiking, fishing, ATMV, off-road biking and horseback riding.

Table 2. Alternative uses by primary user group (in days)

	Primary Activities								
Secondary Activities	Hunting	Camping	Snow-mobiling	Hiking	Fishing	ATMV	Watching Wildlife	Off-road Bicycling	Horseback Riding
ATMV	5	3	4	1	1	41	2	0	3
Off-road bicycling	1	2	2	4	1	0	2	27	0
Camping	5	19	3	5	4	4	3	3	4
Fishing	21	9	9	4	19	8	9	2	5
Hiking	4	7	2	27	2	3	10	8	7
Horseback riding	1	1	1	0	0	1	0	0	28
Hunting	29	5	9	2	7	5	4	6	7
Pack animal use	0	0	0	0	0	0	0	0	0
Plant collecting	1	1	0	1	0	0	0	0	1
Cross-country skiing	1	1	1	3	0	0	1	3	4
Snowmobiling	5	2	23	1	5	12	3	3	0
Watching wildlife	13	10	9	15	3	13	63	6	10
Portion in primary activity	34%	31%	37%	42%	45%	47%	64%	47%	41%
Portion in top three activities	74%	63%	66%	73%	72%	75%	84%	71%	65%

These responses also provide insight into the various overlaps that take place among recreational users. Hunters, for example, were found to spend more days fishing than those respondents who claimed fishing to be their primary activity. Indeed, hunters were found to be very active participants overall as they were one of the top three participants in five of the twelve activities surveyed.

Many of the respondents spent the majority of their recreation days in three different activities. On average, the top three activities accounted for 72% of a participant's total recreation time. Wildlife watchers spent 84% of their recreation days in their top three activities, while campers spent only 63% of their time in their top three categories. By further examining the top three activities for each group summarized, a better understanding can be gained of the correlation between recreational activities.

Six of the nine groups summarized placed watching wildlife in their top three outdoor recreation activities. Hunters and anglers both exhibit correlation with each other's activity. Both ATMV participants and snowmobilers exhibit an affinity for motor sports and watching wildlife. Wildlife watchers on average spent only one-third of their time in activities other than wildlife watching, while most other groups spent significantly more time in non-primary activities. Wildlife watchers appear to correlate with campers and hikers, all three of which spend time hiking.

Compatibility With Other Recreational Uses

Respondents were also asked to describe how compatible their primary activity is with other forest uses. The scores they provided were based on a 1-5 scale, with three being "neutral", 1 being incompatible, and 5 being compatible. The responses varied by primary use and several interesting trends emerge when user groups responses are compared. The complete cross-activity compatibility results can be seen in Table 3.

Table 3. Compatibility of Various Activities Across User Groups

	Level of Compatibility With:						
Primary Activities:	Auto-camping	Use of animals	Bicycling	Primitive camping	Hiking/skiing	Hunting	Motorized vehicle use
Wildlife Watchers	2.67	2.47	3.33	4.00	3.86	2.86	2.36
Snow-mobilers	3.05	2.69	2.74	3.30	3.39	3.30	4.18
Hunters	2.81	3.06	2.67	3.64	3.36	4.74	2.71
Horseback Riders	3.64	4.46	2.64	4.18	4.09	3.36	1.64
Hikers	3.16	3.46	3.54	4.29	4.55	2.84	2.18
Fishers	3.83	3.31	3.26	4.15	3.67	3.57	3.89
Campers	4.06	3.20	4.16	4.27	4.37	2.85	3.01
Bikers	4.00	3.33	4.78	4.29	4.25	2.33	2.33
ATMV	4.05	3.05	3.34	3.4.0	3.53	3.61	4.42

Most respondents gave highest compatibility ratings to their own activities. Horseback riders, for example, found their activity to be most compatible with the use of animals in the forest. Only three groups gave higher than "neutral" ratings to describe their compatibility with motorized vehicle use: fishers, ATMV participants, and snowmobilers. All groups gave higher than neutral scores to hiking/cross-country skiing and primitive camping. Auto-camping was found to be relatively compatible by all groups except for wildlife watchers and hunters. Wildlife watchers and hunters also gave less than neutral ratings to use of animals and motorized vehicle use.

While many groups felt that their activity was compatible with others, such as hiking/cross-country skiing, the other groups did not always agree. Hikers and campers gave lower than neutral scores to hunting and motorized vehicle use. ATMV users gave higher than neutral scores to all of the activities listed, but as mentioned earlier only three groups felt that motor vehicle use was compatible with their activity.

Seasonal Use Patterns

While a recreational user's primary activity may be seasonally based, such as snowmobiling, their overall recreation pattern may be more diffuse. The average allocation of recreational days among the four seasons for the user groups can be seen in Table 4. Summer is the most popular time of year for many activities in Wisconsin, not just forest-based recreation. Among forest-based recreation participants, summer is the most popular for every group except for hunters and snowmobilers. On average, forest-based recreationists spent one-third of their total recreation days in the summertime. Fall and spring are second and third most popular overall with 28% and 22% of the total average recreation time respectively.

Table 4. Seasonal allocations of recreational days by primary user group

	Primary Use								
	Hunting	Camping	Snow-mobiling	Hiking	Fishing	ATMV	Watching Wildlife	Off-road Bicycling	Horseback Riding
Season	Days	Days	Days	Days	Days	Days	Days	Days	Days
Fall	33	11	11	15	13	20	27	16	22
Summer	21	25	12	22	18	27	27	18	29
Spring	11	8	4	12	5	13	22	12	14
Winter	15	6	24	12	10	20	23	13	7

The fall is very popular with both wildlife watchers and hunters. Wildlife watching rates as one of the top three forest-based recreation activities in each of the four seasons. Wildlife watchers, off-road cyclists and horseback riders all find the spring to be a good season for recreation. The winter months are popular with snowmobile riders, ATMV participants and wildlife watchers.

The portion of total recreation time spent in a given season varies by group as well. Those who classified their primary activity as hunting spend 41% of their total recreation days in the fall. Forest-based recreationists who classified their primary activity as snowmobiling spend 47% of their recreation days in the winter. Campers spent nearly half of their recreation time in the summer. Wildlife watchers were the most diffuse, spending no more than 27% of their total recreation time in any one season.

Landownership Of Recreational Sites

The degree to which users rely upon public and private land can provide useful information to both public and private providers of recreational opportunities. Table 5 summarizes the allocation of recreation days to 8 different landownership types by user group. State owned lands and non-industrial private forests figure prominently in the recreation resource accessed by many of the groups surveyed.

Table 5. Landownership of recreational sites by primary user group (in days spent on site)

	Primary Use								
Forest Landownership	Hunting	Camping	Snow-mobiling	Hiking	Fishing	ATMV	Watching Wildlife	Off-road Bicycling	Horseback Riding
Public:									
City / Municipal	1	2	1	5	2	1	2	5	1
County	10	7	9	10	11	16	15	14	4
State	14	52	16	33	26	14	11	44	26
Federal	9	7	15	8	6	13	8	10	10
Public unidentified	5	3	15	9	12	12	4	11	5
Private:									
Non-industrial private	45	18	23	24	27	26	43	2	46
Industrial private	8	2	7	4	4	7	3	3	5
Private (unidentified)	6	6	11	3	7	17	8	4	1

City / municipal land was found to be a relatively insignificant resource to all groups except hikers and off-road bicyclists. County land was used most by ATMV users, off-road cyclists, and wildlife watchers. Industrial forest land received relatively smaller portions of respondents' recreation time; the three groups spending the most time on industrial forest land were hunters, snowmobilers and ATMV users.

The degree to which recreation groups depend upon a single landownership type also varies. Campers, for example, reported spending over 50% of their time on state lands off-road bicyclists also relied heavily on state land. Hunters and horseback riders reported spending over 45% of their time on non-industrial private land. In contrast, snowmobilers and ATMV users dedicated no more than one quarter of their recreation time on any one landownership type.

Regional Use Patterns

Survey respondents were asked to identify locations within Wisconsin where they had recreated during the twelve months prior to the survey. Table 6 presents the percentage of each user group that reported visiting each of the five regions. The results indicate that for some groups, there was only modest geographical preference. Among campers and wildlife watchers, each of the five regions were visited by at least 30% of the user group total. Some groups were prone to avoid certain parts of the state. The southwest region, for example, was visited by only 18% of snowmobilers and less than 10% of the anglers. The southeast and northeast regions were unpopular among horseback riding respondents, while the northwest received limited visits by hikers, off road cyclists and horseback riders.

Table 6. Regional visitation by primary user group (percent reported visiting region).

	Primary Use								
Region	Hunting	Camping	Snow-mobiling	Hiking	Fishing	ATMV	Watching Wildlife	Off-road Bicycling	Horseback Riding
Central	47%	42%	31%	43%	23%	32%	48%	45%	30%
Northeast	51%	53%	71%	44%	68%	41%	39%	37%	20%
Northwest	41%	32%	57%	23%	51%	59%	49%	18%	20%
Southeast	40%	49%	26%	47%	41%	30%	35%	46%	20%
Southwest	27%	44%	18%	54%	10%	26%	43%	59%	50%

The central and northeast regions were found to be popular among almost all groups, with almost a third of the participants in eight of the nine user groups indicating that they had used these areas. Some groups expressed particular affinity for a region. Over 70% of snowmobilers and almost 68% of fishers recreated in the northeast region, while the northwest was popular with the ATMV users. These results reflect the presence of specific recreational site types and variations in climatic conditions.

Importance-performance Analysis (IPA) Measures

The survey results allowed a comparison of issues across user groups to determine what issues are exclusive to specific activities and what issues are more common among forest-based recreation participants. Priorities vary among user groups, as well as their satisfaction with the quality of recreation resources available. Overall, most groups were found to be satisfied with a number of important issues. Issues such as recreational access to public lands and rules and regulations were rated as relatively important compared to other issues.

Other issues were found to be important to many user groups, yet received low satisfaction ratings from respondents. Among these issues were trespass concerns and crowding, as illustrated in Figure 4 and 5. Due to their relatively important and relatively low satisfaction ratings, these are labeled as *issues needing management attention*. These examples illustrate issues that are common for many user groups, but the perception and satisfaction of the user groups surveyed were not always equal. IPA tables illustrating the importance and satisfaction with the issues for each user group can be found in Appendix A.

Many user groups were also found to be largely satisfied with the issues most important to them. ATMV users, campers, snowmobilers and anglers were found to have four or less issues needing management attention. Off-road bicyclists were found to have no such issues. At the other end of the spectrum, wildlife watchers ranked 12 of the 18 issues surveyed as issues needing management attention. Wildlife watchers were found to be satisfied with only three issues: abundance of plant life, quality of county roads and access to public lands.

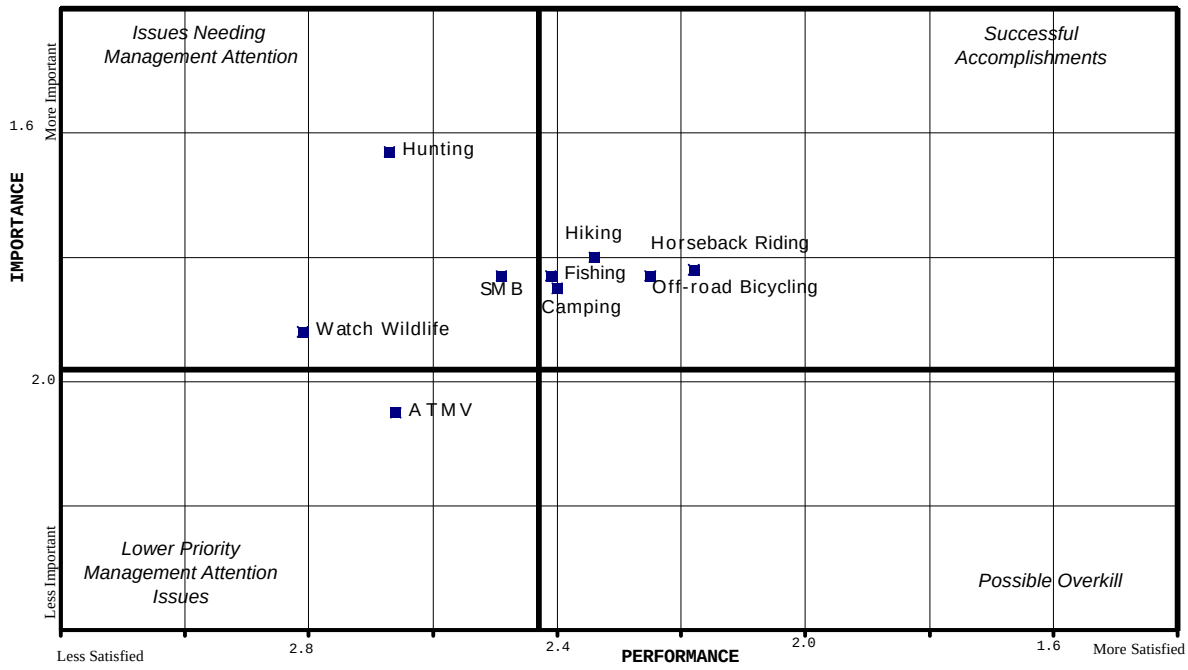

Figure 2. Importance-performance analysis of "access to public lands" by user group.

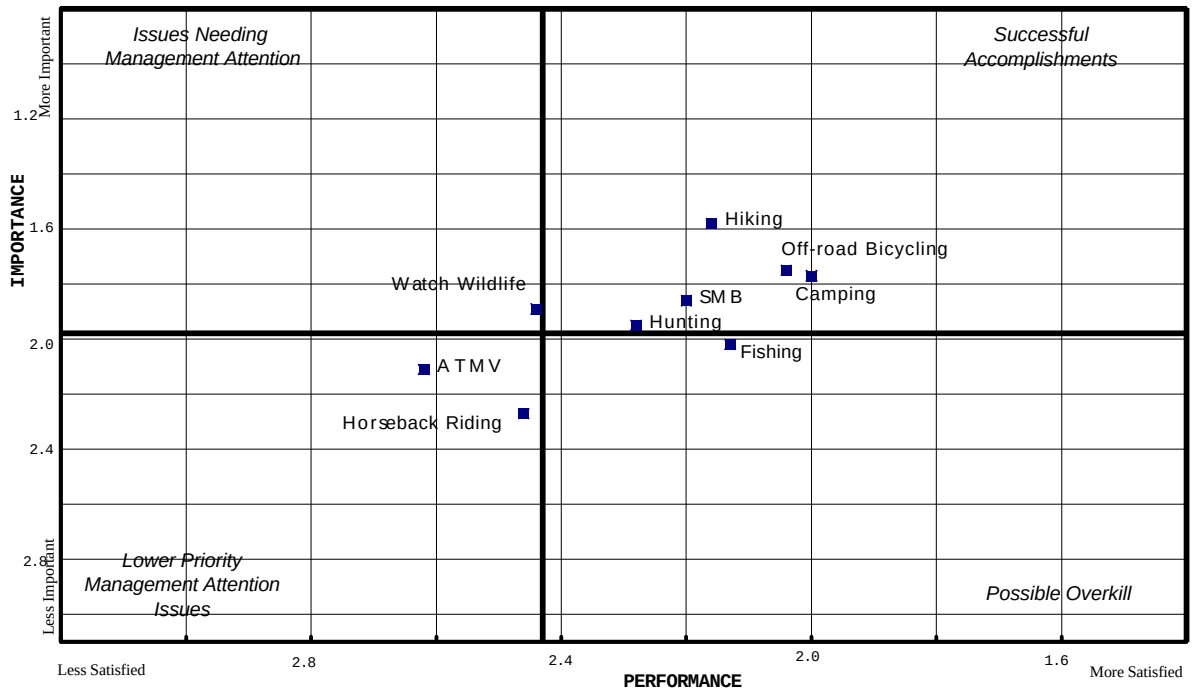

Figure 3 Importance-performance analysis of "rules and regulations" by user group.

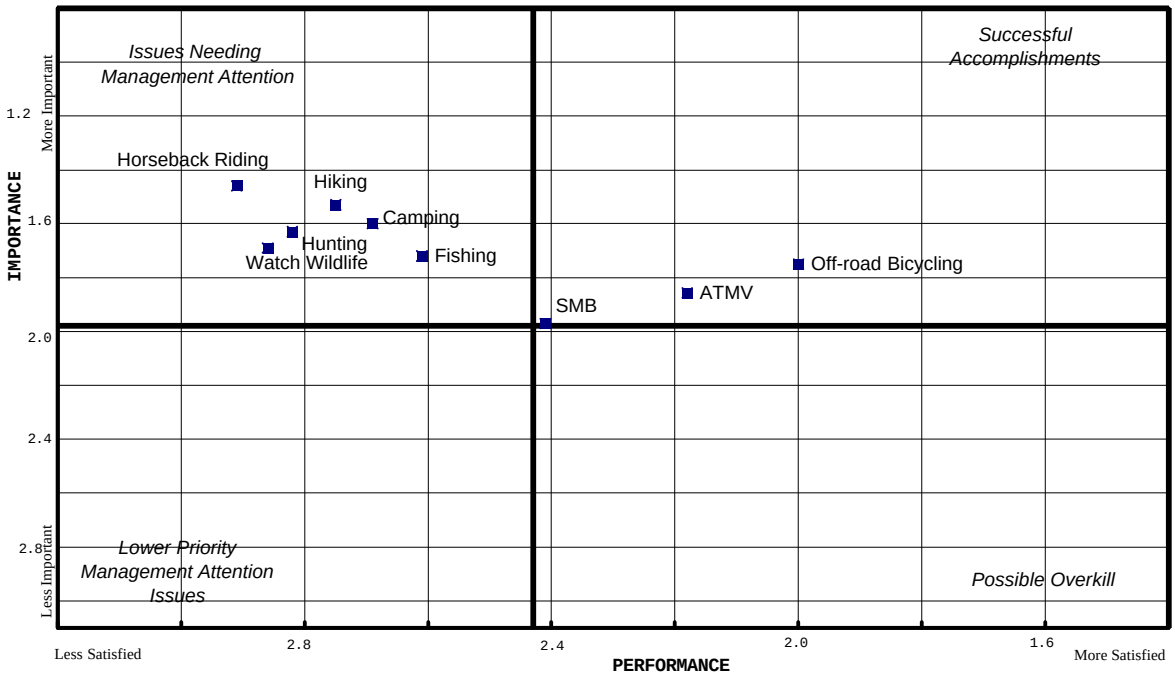

Figure 4: Importance-performance analysis of "trespass concerns" by user group.

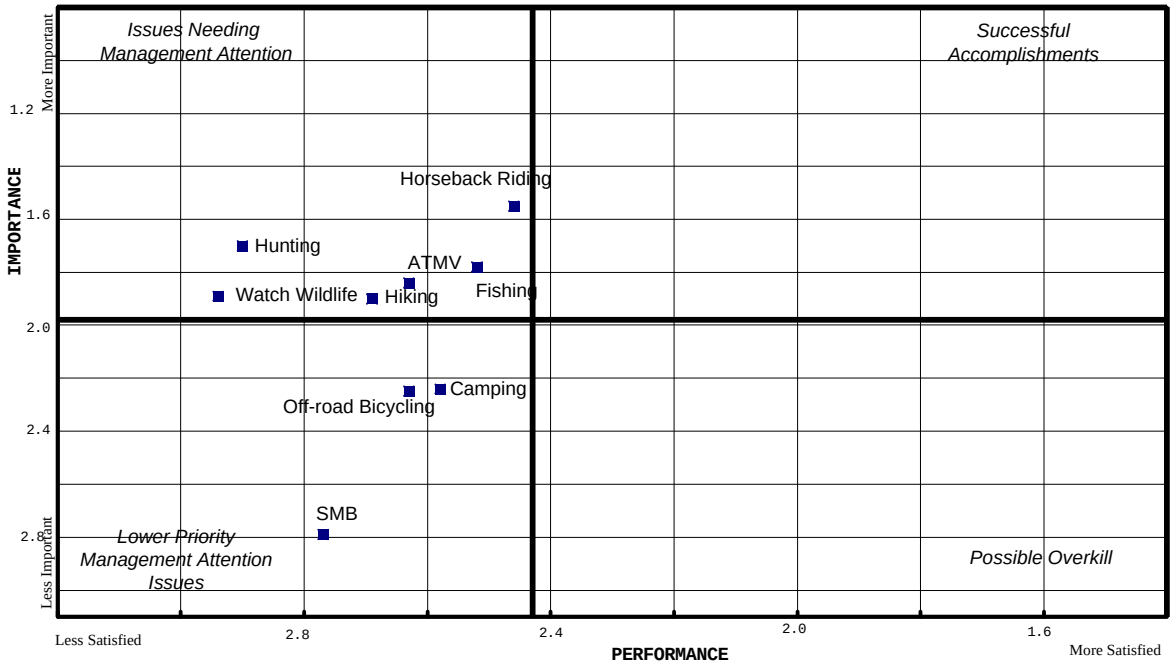

Figure 5: Importance-performance analysis of "crowding" by user group.

Expenditure Patterns

Recreation participants spent different amounts of money based on their recreational activity, and the portion spent in close proximity to the recreation destination varies by activity as well. The survey results include data describing these spending patterns. In the survey we asked respondents to estimate the dollar amount spent annually for forest-based recreation purpose in the following categories:

- entrance or user fees (including public and private campground fees)
- licenses
- groceries / liquor
- restaurants / drinks
- casinos / gambling
- gas, auto service
- overnight stays (hotels, motels, resorts)
- recreation (amusements, etc.)
- recreation equipment (snowmobiles, sporting goods, etc.)
- other retail (gifts, souvenirs, etc.)
- property tax on second home(s)

In addition to total spending, respondents were asked to estimate the portion of spending that took place within 25 miles of where their recreational activities took place.

Eight of the nine groups summarized reported spending the greatest amount for recreation equipment. While this amount consistently exceeded the amount spent in other categories, the portion of total spending for recreation equipment varied by user group. Off-road bicyclists and wildlife watchers reported spending less than a quarter of their recreation dollars on equipment, while hunters, snowmobilers and ATMV users spent over half their total recreation spending on equipment.

Property taxes on a second home (or homes) also ranked high as a spending category. The spending results for this category imply variation in second home ownership among different user groups. Property taxes were found to be one of the top four spending categories for seven of the nine groups summarized. Taxes were the highest spending category for wildlife watchers, but were relatively unimportant for campers. Campers were also found to spend less on property taxes as their level of involvement in camping increased. Simply stated, campers tended to *not* own second homes.

Other spending categories that consistently appeared at the top of the list included groceries, gas and auto service, and restaurants / bars. These same three categories emerged as popular items for local spending (the amount spent within twenty-five miles of a recreation destination). It was typical for each user group to allocate upwards of 50% or more of their total spending for these three categories at the local level. Fishing participants, for example, reported spending almost three-quarters of their recreational restaurant spending at the local area. Still, none of the other spending categories approach the amount spent at the local level on recreation equipment. Local spending

averages on recreation equipment range from almost $1100 for ATMV users and $1050 for snowmobilers to $28 for off-road cyclists.

Total local spending amounts by user group indicated that the groups with the greatest ability to stimulate economic activity at the local level include snowmobilers, ATMV users, hunters, anglers and wildlife watchers. Each of these groups were found to spend, on average, over $800 at the local level. The average amount spent locally by ATMV users alone approached $2000. What this survey does not indicate, which complicates these findings, is whether or not such local spending is actually taking place near a respondent's residence. For example, an ATMV user who lives within twenty-five miles of his or her most accessed recreation resource will be expected to spend a significant portion locally as the residence and the recreational destination are one in the same. It is also difficult to infer aggregate spending by user group as the survey does not reflect total overall participation in each activity.

The overall portion of recreational spending that respondents indicated spending locally varied by user group, from a high of 47% by wildlife watchers to a low of 11% by horseback riders.[1] The amount of data available to describe spending by each user group precludes simple summarization. Detailed spending information for each user group is provided in Appendix A.

SUMMARY AND POLICY IMPLICATIONS

This project provides additional analysis of a survey-based data set of forest-based recreationists in Wisconsin. Our objectives in doing this analysis were to more clearly describe characteristics of the prominent recreational user groups found in Wisconsin.

The primary issues that were found needing management attention across user groups included trespass concerns and crowding. These issues are complex in nature and potentially difficult to address. Trespass concerns are likely to increase if recreational land continues to be divided and fragmented. Recent changes in state trespass laws may make this issue even more contentious. Under the new law, notice of "no trespassing" is not required for land that is fenced, cultivated, undeveloped or occupied by a barn or other agricultural structure, and it is trespass for a person to enter or remain on such lands without permission (Wisconsin State Statute 943.13 1997).

The net effect of the law change is unclear, but access to recreational land is likely to remain an issue for years to come. Resolving trespass concerns may involve public-private initiatives to identify prime recreation areas that are compatible with public access. The Wisconsin Managed Forest Law targets tax breaks to forest owners who follow a prepared forest management plan. This program includes an incentive to

[1] Low sample size for horseback riders may preclude meaningful generalizations for this activity.

landowners who “open” land for recreational opportunities (Wisconsin State Statute 77.83 1997). Policy makers may be wise to continue working with industrial forest owners to ensure that recreational opportunities are considered in the land use decision making process.

Crowding concerns may be alleviated to some extent if recreational access to private land is improved. Other management initiatives may be used to reduce crowding or the perception of crowding. It is not surprising that the groups least satisfied with crowding are the “silent sports” such as hiking, camping, watching wildlife, and fishing. Motorized users such as ATMV users and snowmobilers, were found to be relatively satisfied. It is probable that “silent sports” participants are less satisfied because they are aware of more competing participants than those involved in motorized sports. For example, a participant riding a snowmobile may be completely unaware of a nearby cross-country skier, while that same skier may be aware of all the snowmobiles within hearing range. Maintaining large-scale separation between motorized and non-motorized activities could improve the perceptions of silent sports participants as they may be aware of fewer recreationists during their experience if so removed. In many cases, such separation may be possible by allowing only certain activities on scarce land resources.

At the heart of the motorized versus non-motorized issue are the perceptions of the user groups themselves. Motorized users view their activity as largely compatible with other recreational uses, while non-motorized users find the use of motorized vehicles as incompatible with their activity. The crowding issue described above may be one component of the difference in perceptions, but there may also be differences in land use ethics among these groups. Work done by the Wisconsin Department of Natural Resources indicate that the number of motorized users is likely to increase over the next five years, placing more pressure on what appears to be an already limited resource. Further work to describe the nature of the motorized versus non-motorized issue may be helpful in developing creative solutions to what will likely be a continuing source of recreational use conflict on forested land in Wisconsin.

Seemingly simple solutions to crowding problems may, in fact, exacerbate the situation. For example, designers of a hiking trail may wish to reduce the potential for crowding on the trail by under-designing an adjacent parking lot to accommodate a smaller number of vehicles. Those who must change their hiking plans when the parking lot is full may be forced to use a substitute trail that allows multiple, incompatible uses. Multiple use trails are currently seen as a feasible alternative to building more trails to relieve crowding, but one must consider whether the shared users are truly compatible. Our work suggests that most recreationists find their own sport to be most compatible; this may mean that they are willing to accept more users or increased congestion so long as the other users encountered are participating in the same activity.

Our findings related to resource ownership can also be used to create innovative solutions to the crowding problem. For example, hunters, ATMV users and snowmobilers all exhibited a greater tendency to use industrial private forest land for recreation. An opportunity exists for state and local governments to develop or improve incentives that encourage industrial forestry concerns to not only allow these uses, but to also manage their properties in a way that promotes and enhances recreational use by these three groups. Relieving the pressure on public lands through public-private partnerships can be very useful where crowding is an issue. Through creative cooperation, crowding can be alleviated without the need to acquire more public land or develop more publicly owned recreational resources.

Such a program could require some estimate of the extent of crowding on nearby public lands such as a standardized user satisfaction rating. Where crowding is found to be severe, appropriate incentives could be used to make surrounding industrial forests more attractive to motorized uses and hunting. These incentives could include partnerships between state and local governments or between government and private entities. Follow up evaluations to determine program effectiveness could be used to modify and improve these programs over time.

Models of such a program can be found throughout Wisconsin. Many municipal golf courses are run by non-profit organizations that manage the day-to-day functions of the recreation resource. One interesting example of a public-private-non-profit partnership can be found in Minocqua, Wisconsin at the Winter Park cross-country ski area. At Winter Park, the town of Minocqua has a lease agreement with the industrial forest owner to ensure access for cross-country skiers. A non-profit organization, the Lakeland Ski Touring Foundation, manages the trails and a ski lodge to provide high quality recreational experiences. By cooperating, these three groups create increased value from multiple use of Wisconsin's natural resources (Clausen 1998).

Local concerns about economic development are sure to be raised during any discussion of motorized versus non-motorized recreational uses. The results presented in this paper indicate that significant differences exist between the spending habits of these two groups, particularly at the local level. What is more difficult to assess is the aggregate effect of the total number of participants in these activities. Recent surveys indicate that the number of hikers in Wisconsin outnumbers the number of ATMV users seven-to-one (National Sporting Goods Association 1998; Wisconsin Blue Book 1998). The lack of information describing number of participants involved in each recreational activity and their cumulative spending power may make it more difficult to choose an activity to target for tourism promotion and economic development.

Economic development is only one aspect of local concerns regarding forest management. User values and norms may be incompatible between local and non-local populations. Where these norms and values conflict, relations between local and non-local users may degenerate. For example, local populations relying on the fishing

opportunities in a community as a significant portion of their individual recreation resource may become frustrated if the lake or river they use is overrun by non-local motorboat users. These feelings may be amplified when the conflicting norms relate to a community's economic livelihood. Non-local users who view a forest primarily as a recreational resource may wish to prevent timber harvest practices to enhance their own use of the forest. They may not understand the full impact on a local community if timber harvesting is eliminated as a management objective. The local community, in turn, may view the non-local recreationists in a negative light.

User fees are an increasingly important issue among public policy makers as revenue sources become increasingly constrained. The results of the importance-performance analysis suggest that user fees are a relatively insignificant aspect of the forest recreation experience. Even campers, who were found to spend the most annually for entrance or user fees, rated twelve other issues as more important than user fees. While an equity argument may be made for maintaining low user fees, it is entirely likely that those with extremely low incomes lack the resources needed to access recreation facilities that charge fees. A low-income inner city family without a car or paid vacation time will have a difficult time visiting state parks regardless of the entry fee. Nonetheless, equity issues are a concern for this type of regressive revenue generation mechanism.

It is entirely possible, however, for local and non-local groups to have different feelings towards fees. The work reported here did not fully capture information describing attitudes of local versus non-local recreation users. But the above stated equity argument may be used to compare local versus non-local abilities to pay. If income disparities exist between those who live near a resource and those who travel to a resource, the impact of a user fee will likely be greater on a local resident.

FURTHER RESEARCH

A standardized measure of crowding is needed to identify those areas in need of management intervention. Currently, there is a general lack of data describing actual usage of particular areas within Wisconsin. Furthermore, there is little information to evaluate the "capacity" of properties with respect to the different recreational uses they provide. For example, a one-hectare forest visited by 15 hikers on a fall day may result in 15 quality outdoor recreation experiences with no perceived crowding. The same property visited by five hunters, two ATMV users, six hikers and three off-road cyclists may lead to 15 extremely poor experiences due to user perceptions of overcrowding. To minimize the cost and complexity of implementing such a survey, an initial scan of the recreation resources in Wisconsin could be conducted to identify those areas most likely to experience crowding in the coming years.

To identify areas that are likely candidates for future crowding one needs to create recreation demand forecasts for specific sites. A number of models exist to create forecasts, many of which rely upon standardized methods to predict visitation of particular recreational resources. Work is needed to identify the relevance of such work for a particular site and to explore the potential for creating a standardized state, region or site specific model for use in Wisconsin.

Further research is also needed to identify the potential variations that exist in perceptions between those who live in a community where a recreation resource is located (locals) and those who travel to a resource to enjoy outdoor recreation (non-locals). Local versus non-local opinions may vary on such issues as the importance of timber harvesting, the compatibility of motorized and non-motorized recreation, as well as the need for and impact of recreational user fees. Such information would ideally be gathered though on-site surveys. This data could then be used to evaluate the economic and social impact of management alternatives.

Additional economic research could explore the effect of public land purchases on local land prices. Short-term effects would likely be seen on properties adjacent to public recreational land, while there may also be a significant effect on regional land prices where public land investment is great. Again, standardized methods could be applied to test the relationship between public investment and private prices.

Numerous forest properties can be found in Wisconsin that are managed to meet high levels of demand from multiple, often incompatible, uses. One such area is the Richard I. Bong State Recreation Area in southeastern Wisconsin. This property is managed both spatially and temporally to meet the needs presented by two major metropolitan areas, Chicago and Milwaukee. Such management is accomplished by allowing user groups to cooperatively devise management plans and schedules which keep highly incompatible uses separated. An in-depth examination of the process used on this property may identify tools and strategies that could be applied in other areas where incompatible uses present conflict.

Lastly, better methods of assessing and forecasting outdoor recreation demand for particular activities would assist in developing future land management policies. While broad statements can be made based on the research presented here and elsewhere, accurate activity level forecasts are largely absent from recreation planning processes in Wisconsin. To create future forecasts, information needs to be collected today. The exact nature of the data to be collected will depend on the expected accuracy of the forecasts and the resources available to perform data collection. State and local interests would be wise to cooperatively design a project for collecting the needed data and ensure its interpretation and application to enhance recreation planning.

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Appendix A

This section is organized to allow for quick reference to the characteristics of specific user activities. For each activity, the data is summarized to describe the following characteristics:

Alternative uses by primary user group: Survey respondents were asked to identify their primary activity as well as other activities they participate in. Question 1 of the survey included a list of 12 forest-based recreational activities; respondents were asked to report the number of days that they had spent in each of the activities. Later in the survey (in question 21), respondents were asked to select one primary forest-based recreational activity. Their responses provide insight into the various overlaps that take place among recreational users.

Compatibility with other recreational uses: Following the identification of their primary activity, respondents were asked to describe how compatible that activity was with other forest uses. Our efforts to assess compatibility took the form of detailed Likert scale responses to standardized statements posed to forest recreationists. These statements focused on compatibility with forest management activities, other recreationists, and land use regulations. Respondents ranked each activity for compatibility on a scale of one to five with a value of one assigned to those activities "very compatible" with a primary activity and five to those ranked as "very incompatible." A value of three indicated a "neutral" compatibility with the respondents' primary activity.

Seasonal use patterns: While a recreation user's primary activity may be seasonally based, such as snowmobiling, his/her overall recreation pattern may be more diffuse. To capture this seasonal variation in participation, respondents were asked to allocate their total days identified in question 1 to the four seasons.

Landownership of recreational sites: The degree to which users rely upon public and private land can provide useful information to both public and private providers of recreation opportunities. Question 3 of the survey asked respondents to identify the percentage of their total recreation time spent on land in eight landowner classifications. These classifications included: *private land owned by the timber industry; private land not owned by the timber industry; don't know, but definitely private land; federal land; state land; county land; city/municipal land; and don't know, but definitely public land.* Respondents were instructed that their total percentages should equal 100.

Regional use patterns: Within Wisconsin, variations are evident in the use patterns and characteristics of forest-based recreational participants. To capture this information, the survey included a map on which respondents indicated the locations in the state that they had recreated within the past year. The respondent's indications were then interpreted on a broad regional basis: Northeast, Southwest, Central, Northwest, and Southeast Wisconsin. (See Figure 1.)

Expenditure patterns: Recreation participants spend different amounts of money based on their activity. The amount spent at the recreational location varies by activity as well. The survey included a list of eleven recreational spending categories. Respondents were asked to estimate the amount spent in each category within the twelve-month period before the survey was administered. They were also asked to estimate the percentage of spending in each category that took place within 25 miles of their actual recreational sites.

Importance performance analysis (IPA) measures: Priorities vary among user groups, as well as their satisfaction with the quality of recreation resources available. The methodology of IPA analysis for this paper follows that of Uysal and Howard (1991). Average importance and performance measures for 18 land management issues were derived for each primary activity. These scores were then plotted relative to the grand means of importance and performance given by all groups for each of the issues. The resulting diagrams allow for easy comparison across user groups and across issues.

Hunting

Table 1-1 summarizes the days spent by Wisconsin's forest-based hunters in various recreational activities. Hunters in the high involvement category are more active in all other activities polled with the exception of cross-country skiing and hiking. All hunting involvement categories were found to be active in anglers and wildlife watchers, while snowmobiling and camping were also found to be likely secondary activities. Low involvement hunters were found to spend more days fishing than hunting.

Like all other participants surveyed, hunters identified their activity as most compatible with itself, as illustrated in Figure 1-1. Hunters gave "compatible" ratings to three activities: primitive camping, hiking/skiing, and use of pack animals. Hunters gave the lowest ratings to bicycling and motorized vehicle use.

Seasonal preferences of hunters are summarized in Table 1-2. High and medium involvement hunters identified autumn as their most active season, spending twice as much time recreating in the fall as they did in the summer. Those hunters spending 1-5 days participating were found to be most active in the summer, which is consistent with the low involvement category's interest in fishing.

Landownership preferences of hunters are summarized in Table 1-3. Private land not owned by the timber industry was the most commonly used land for all involvement categories. State land was found to be the second most popular landownership classification, followed by county land. Hunters in the high involvement category reported spending a greater percentage of time on land owned by the timber industry than those in the low involvement category.

Regional preferences of hunters are summarized in Table 1-4. The northeast portion of the state was most popular among all involvement categories. The central area was second most popular, followed by the northwest. The southeast area was found to be least popular, and this portion of the state was found to be the only area used by less than 39% of the high and medium involvement categories.

Table 1-5 provides a detail of the amount spent by hunters in each category surveyed and the calculated amount spent near the recreation location. All hunting involvement categories were found to spend the most on recreation equipment; low involvement category hunters reported averaging $183 annually, while medium and high involvement categories reported $1,218 and $1,500 respectively. It can be seen that local spending on gas and auto service, groceries, restaurants, and bars makes up about one-third of all local spending. It is interesting to note that local spending for overnight stays makes up no more than one-third of the total amount spent on this category; this suggests that the majority of money spent by hunters for this purpose is used enroute to their recreational site.

The importance-performance analysis (IPA) component of the results for hunters is illustrated in Figure 1-2. The IPA reveals high concern and low satisfaction among hunters for a number of forest elements including crowding, silt-free streams, and rules and regulations. Hunters were also concerned yet satisfied with elements such as abundance of wildlife, diversity of wildlife, and general environmental quality.

Table 1-1. Recreational activities of hunters by hunting involvement category.

Activity	Hunting Involvement Category (# of hunting days/yr.)					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean use	S	Mean use	s	Mean use	s
All-terrain motorized vehicle	.64 (n=36)	1.97	5.52 (n=246)	16.65	5.85 (n=380)	18.12
Off-road bicycling	1.28 (n=36)	3.58	.29 (n=246)	1.22	1.80 (n=379)	7.28
Camping	1.94 (n=36)	4.14	2.80 (n=246)	7.22	6.12 (n=379)	14.38
Fishing	8.50 (n=36)	12.31	12.96 (n=246)	18.07	27.88 (n=379)	32.28
Hiking	2.25 (n=36)	5.83	2.42 (n=246)	9.26	4.82 (n=378)	16.46
Horseback riding	.11 (n=36)	.39	.36 (n=246)	2.84	1.01 (n=380)	6.78
Hunting	2.81 (n=36)	2.14	13.65 (n=246)	4.76	41.94 (n=378)	21.11
Pack Animal Use	.03 (n=36)	.16	.00 (n=246)	.00	.06 (n=380)	.60
Plant collecting	.08 (n=36)	.36	.37 (n=246)	2.34	.75 (n=378)	4.17
Cross-country skiing	.14 (n=36)	.83	.86 (n=246)	7.15	.68 (n=379)	4.02
Snowmobiling	2.36 (n=36)	6.23	4.20 (n=246)	7.93	5.77 (n=378)	14.81
Watching wildlife	3.61 (n=36)	6.73	8.78 (n=246)	35.11	16.82 (n=378)	41.20

- indicates no representative cases

Table 1-2. Seasonal incidence of forest-based recreation by hunting involvement category.

Season	Hunting Involvement Category (# of hunting days/season)					
	LOW (0–5 days)		MED(6-20 days)		HIGH(>20days)	
	Mean use	S	Mean use	s	Mean use	s
Fall	6.24 (n=34)	5.72	19.24 (n=243)	17.33	43.97 (n=395)	24.53
Summer	8.83 (n=35)	11.65	14.58 (n=245)	20.70	25.70 (n=395)	27.90
Spring	3.83 (n=35)	5.78	7.11 (n=244)	14.95	14.48 (n=398)	19.52
Winter	3.86 (n=35)	7.25	9.25 (n=244)	15.10	18.75 (n=397)	22.39

- indicates no representative cases

Table 1-3. Ownership of land used by hunting involvement category.

Landownership	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	S	Mean %	s	Mean %	s
Public:						
City / municipal land	.30 (n=33)	1.47	.47 (n=236)	2.15	1.49 (n=397)	7.31
County land	10.85 (n=33)	21.97	11.00 (n=236)	19.02	9.48 (n=397)	16.28
State land	17.88 (n=33)	29.76	13.60 (n=236)	19.79	14.11 (n=397)	19.47
Federal Land	4.85 (n=33)	14.60	8.95 (n=236)	18.09	9.34 (n=397)	16.25
Public Land (unidentified)	2.58 (n=33)	7.51	5.84 (n=236)	17.33	3.90 (n=397)	12.13
Private:						
Private land not owned by the timber industry	45.33 (n=33)	40.78	41.74 (n=236)	34.33	46.97 (n=397)	30.79
Private land owned by the timber industry	4.24 (n=33)	11.39	6.89 (n=236)	18.43	8.54 (n=397)	18.16
Private land (unidentified)	8.64 (n=33)	22.64	6.94 (n=236)	21.26	5.71 (n=397)	18.11

- indicates no representative cases

Table 1-4. Distribution of forest-based recreational use by hunting involvement category across Wisconsin regions.

Region	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	S	Mean %	s	Mean %	s
Central	.39 (n=28)	.50	.46 (n=215)	.50	.48 (n=369)	.50
Northeast	.46 (n=28)	.51	.47 (n=215)	.50	.54 (n=369)	.50
Northwest	.39 (n=28)	.50	.39 (n=215)	.49	.42 (n=369)	.49
Southeast	.25 (n=28)	.44	.39 (n=215)	.49	.41 (n=369)	.49
Southwest	.18 (n=28)	.39	.24 (n=215)	.43	.29 (n=369)	.45

- indicates no representative cases

Table 1-5. Annual household recreational expenditure patterns by hunting involvement category.

Spending Category	Dollar amount spent for recreation purposes					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Global $	Local $	Global $	Local $	Global $	Local $
Gas / Auto Service	136.25 (n=32)	45.73	189.15 (n=233)	96.01	285.35 (n=396)	147.18
Casino	60.47 (n=32)	17.84	58.64 (n=233)	15.09	42.54 (n=396)	3.98
Rec. Equipment	182.81 (n=32)	33.77	1218.46 (n=233)	435.36	1500.21 (n=396)	590.78
User Fees	25.28 (n=32)	7.15	26.90 (n=233)	8.75	37.01 (n=396)	10.77
Groceries	123.13 (n=32)	50.14	279.08 (n=233)	128.38	266.41 (n=396)	132.73
Overnight Stays	73.09 (n=32)	19.65	76.28 (n=233)	17.64	93.35 (n=396)	21.75
Licenses	41.31 (n=32)	14.74	74.12 (n=233)	38.38	106.50 (n=396)	56.43
Recreation	46.41 (n=32)	15.16	28.69 (n=233)	6.14	80.55 (n=396)	22.38
Restaurants / Drinks	103.44 (n=32)	48.49	140.73 (n=233)	79.01	185.07 (n=396)	92.54
Other Retail	39.53 (n=32)	12.23	52.15 (n=233)	9.21	53.20 (n=396)	13.98
Property Tax	157.81 (n=32)	19.73	297.57 (n=233)	56.54	214.77 (n=396)	35.93

- indicates no representative cases

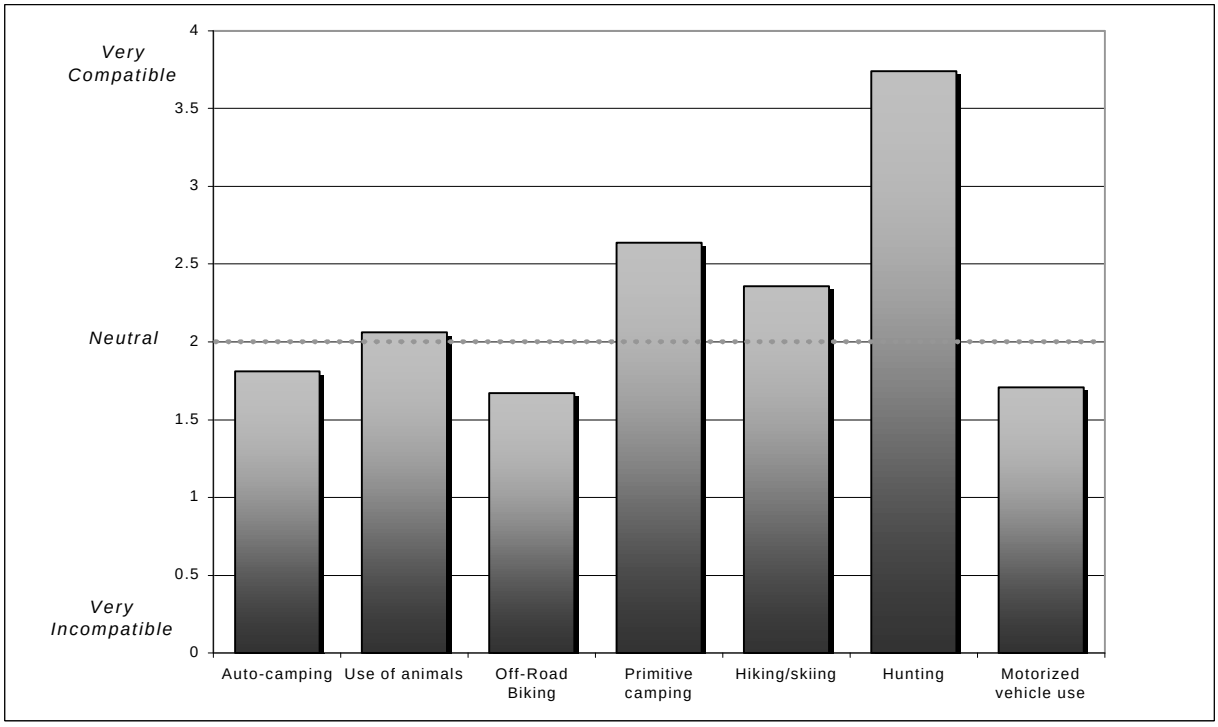

Figure 1-1. Compatibility of hunting with seven activities.

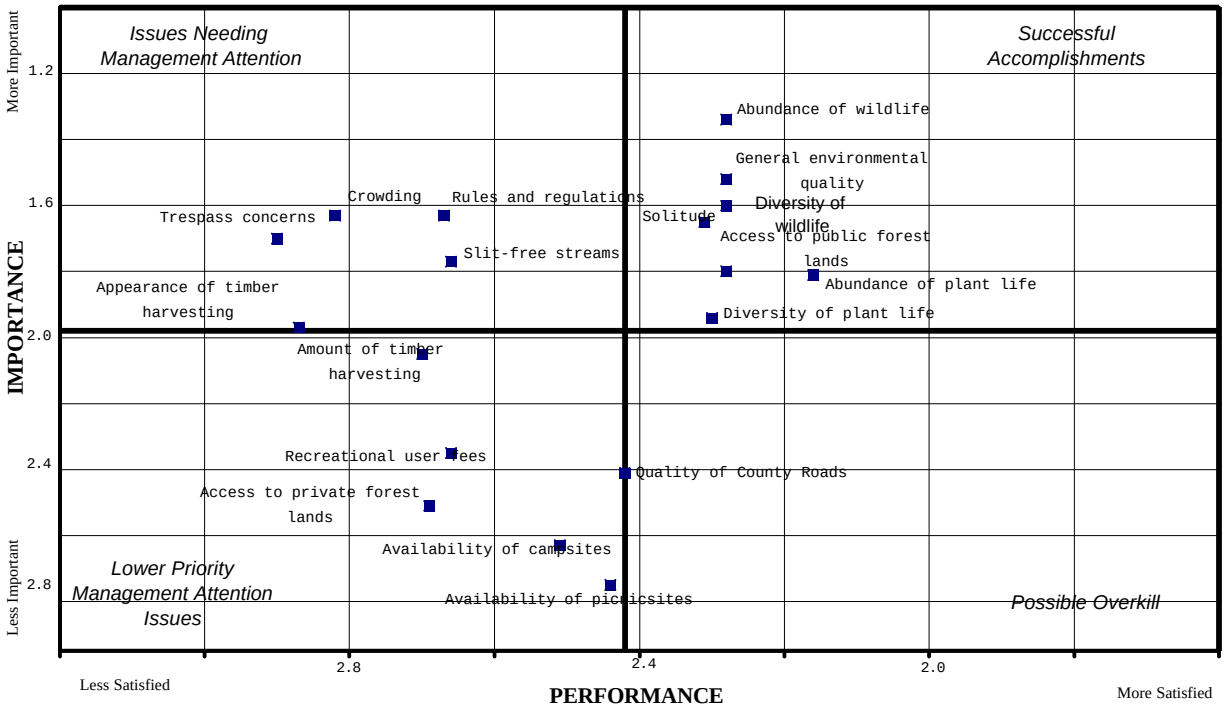

Figure 1-2. Perceptions of hunters.

Camping

The secondary activities of respondents who chose camping as their primary activity are summarized in Table 2-1. Low involvement campers were generally inactive in all other activities, with higher participation in fishing and hunting. Medium involvement category campers also enjoyed fishing, but spent more time watching wildlife than hunting. High involvement campers spent more time watching wildlife than any other secondary activity. They also spent more time hiking and horseback riding than other involvement categories.

Camping respondents gave highest compatibility ratings to auto-camping, primitive camping, hiking / skiing and bicycling. These results are summarized in Figure 2-1. They also gave somewhat compatible ratings to use of animals. Overall, campers gave neutral responses towards motorized vehicle use and gave a slightly incompatible rating to hunting.

Seasonal preferences of campers are summarized in Table 2-2. Across involvement categories, summer was the most popular season for campers, followed by fall, spring, and winter. This is consistent with the optimal camping seasons in Wisconsin and may also reflect the availability of camping areas, many of which are open between Memorial Day and Labor Day.

Landownership preferences of campers are summarized in Table 2-3. State land was found to be most popular among all camping involvement categories, followed by private land. County and federal land was found to be about equally popular, each accounting for about 6% of the typical Wisconsin camper's forest recreation day.

Geographical preferences of campers are summarized in Table 2-4. Low involvement campers were likely to camp in the northeast, southeast, and southwest portions of Wisconsin, while medium involvement campers also spent time in the central portion of the state. High involvement campers were most likely to recreate in the northeast portion of the state and least likely to camp in the southwest.

Reported spending by campers can be seen in Table 2-5. Spending patterns varied among the different involvement categories, with low involvement categories spending about the same amount on equipment, gas / auto service, groceries, vacation home property tax, and restaurants / drinks. Medium involvement category campers spent more money on groceries than any other category. High involvement campers, alternatively, spent the greatest amount on recreation equipment. High involvement campers also reported spending more money on user fees than other involvement categories.

The IPA analysis for campers is summarized in Figure 2-2. Campers gave high importance and low satisfaction scores to availability of campsites, crowding, and silt-free streams. Campers were found to be satisfied with a number of high importance items, including solitude, diversity of wildlife, and access to public forest lands.

Table 2-1. Recreational activities of campers by camping involvement category.

Activity	Camping Involvement Category (# of camping days/yr.)					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean use	s	Mean use	s	Mean use	s
All-terrain motorized vehicle	2.56 (n=37)	6.07	3.21 (n=108)	17.87	1.86 (n=50)	9.12
Off-road bicycling	.87 (n=37)	2.31	1.96 (n=108)	3.93	1.76 (n=50)	6.64
Camping	2.87 (n=37)	2.07	12.58 (n=108)	4.49	43.85 (n=49)	35.65
Fishing	4.38 (n=37)	10.57	7.83 (n=108)	12.44	14.88 (n=49)	22.61
Hiking	1.05 (n=37)	1.78	4.15 (n=108)	6.82	19.41 (n=49)	55.23
Horseback riding	.03 (n=37)	.16	.18 (n=108)	.70	4.58 (n=50)	28.99
Hunting	5.30 (n=37)	14.42	3.85 (n=108)	7.06	8.44 (n=50)	14.09
Pack Animal Use	.00 (n=37)	.00	.00 (n=108)	.00	.00 (n=50)	.00
Plant collecting	.11 (n=37)	.38	.14 (n=108)	.84	1.70 (n=50)	7.42
Cross-country skiing	.19 (n=37)	.70	1.17 (n=108)	2.79	2.60 (n=50)	9.25
Snowmobiling	2.30 (n=37)	6.40	2.20 (n=108)	5.29	2.54 (n=50)	6.37
Watching wildlife	2.24 (n=37)	5.17	5.66 (n=108)	20.09	26.20 (n=50)	73.60

- indicates no representative cases

Table 2-2. Seasonal incidence of forest-based recreation by camping involvement category.

Season	Camping Involvement Category (# of camping days/season)					
	LOW (0–5 days)		MED(6-20 days)		HIGH(>20days)	
	Mean use	s	Mean use	s	Mean use	s
Fall	5.84 (n=37)	10.94	8.50 (n=107)	11.53	19.80 (n=54)	26.36
Summer	10.17 (n=35)	16.04	21.22 (n=107)	18.14	41.21 (n=53)	34.75
Spring	3.00 (n=37)	9.24	6.87 (n=108)	11.71	15.20 (n=54)	22.46
Winter	2.83 (n=36)	7.40	5.52 (n=107)	9.49	10.74 (n=54)	16.92

- indicates no representative cases

Table 2-3. Ownership of land used by camping involvement category.

Landownership	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	s	Mean %	s	Mean %	s
Public:						
City / municipal land	.86 (n=35)	3.73	1.78 (n=106)	5.20	1.55 (n=56)	3.58
County land	5.29 (n=35)	11.62	6.76 (n=106)	10.09	9.07 (n=56)	16.30
State land	60.86 (n=35)	37.37	51.32 (n=106)	33.51	46.32 (n=56)	33.99
Federal Land	5.43 (n=35)	11.97	6.62 (n=106)	13.36	7.20 (n=56)	15.74
Public Land (unidentified)	1.29 (n=35)	4.08	2.71 (n=106)	9.18	4.45 (n=56)	12.04
Private:						
Private land not owned by the timber industry	20.37 (n=35)	30.11	16.94 (n=106)	26.45	19.41 (n=56)	31.04
Private land owned by the timber industry	1.71 (n=35)	7.06	1.70 (n=106)	7.05	2.13 (n=56)	7.12
Private land (unidentified)	1.57 (n=35)	5.39	5.80 (n=106)	19.39	8.21 (n=56)	22.11

- indicates no representative cases

Table 2-4. Distribution of forest-based recreational use by camping involvement category across Wisconsin regions.

Region	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	s	Mean %	s	Mean %	s
Central	.13 (n=31)	.34	.45 (n=93)	.50	.55 (n=49)	.50
Northeast	.52 (n=31)	.51	.45 (n=93)	.50	.69 (n=49)	.47
Northwest	.13 (n=31)	.34	.29 (n=93)	.46	.49 (n=49)	.50
Southeast	.39 (n=31)	.50	.53 (n=93)	.50	.49 (n=49)	.50
Southwest	.39 (n=31)	.50	.50 (n=93)	.50	.37 (n=49)	.48

- indicates no representative cases

Table 2-5. Annual household recreational expenditure patterns by camping involvement category.

Spending Category	Dollar amount spent for recreation purposes					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Global $	Local $	Global $	Local $	Global $	Local $
Gas / Auto Service	127.35 (n=34)	56.38	134.40 (n=100)	**57.52**	200.28 (n=53)	81.35
Casino	31.47 (n=34)	5.55	15.70 (n=100)	1.52	15.00 (n=53)	4.92
Rec. Equipment	1352.35 (n=34)	322.13	164.19 (n=100)	42.21	674.43 (n=53)	149.93
User Fees	48.29 (n=34)	27.14	97.48 (n=100)	62.01	227.96 (n=53)	138.62
Groceries	104.85 (n=34)	43.91	217.45 (n=100)	93.87	276.23 (n=53)	124.55
Overnight Stays	54.56 (n=34)	8.66	69.63 (n=100)	13.63	63.49 (n=53)	16.77
Licenses	31.97 (n=34)	11.07	25.85 (n=100)	8.45	48.91 (n=53)	15.04
Recreation	30.88 (n=34)	5.75	56.25 (n=100)	19.88	71.79 (n=53)	29.89
Restaurants / Drinks	91.03 (n=34)	36.38	133.45 (n=100)	73.93	108.15 (n=53)	61.57
Other Retail	23.38 (n=34)	3.56	41.30 (n=100)	16.63	117.74 (n=53)	44.67
Property Tax	102.94 (n=34)	9.08	24.00 (n=100)	0.48	29.42 (n=53)	1.67

- indicates no representative cases

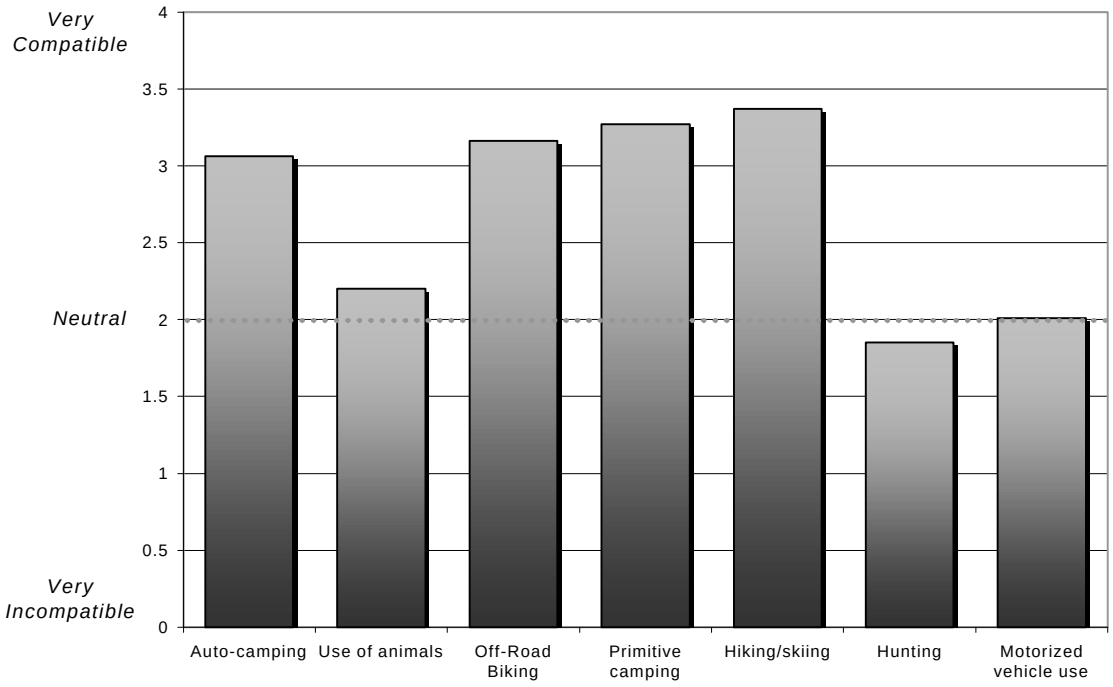

Figure 2-1. Compatibility of campers with seven activities.

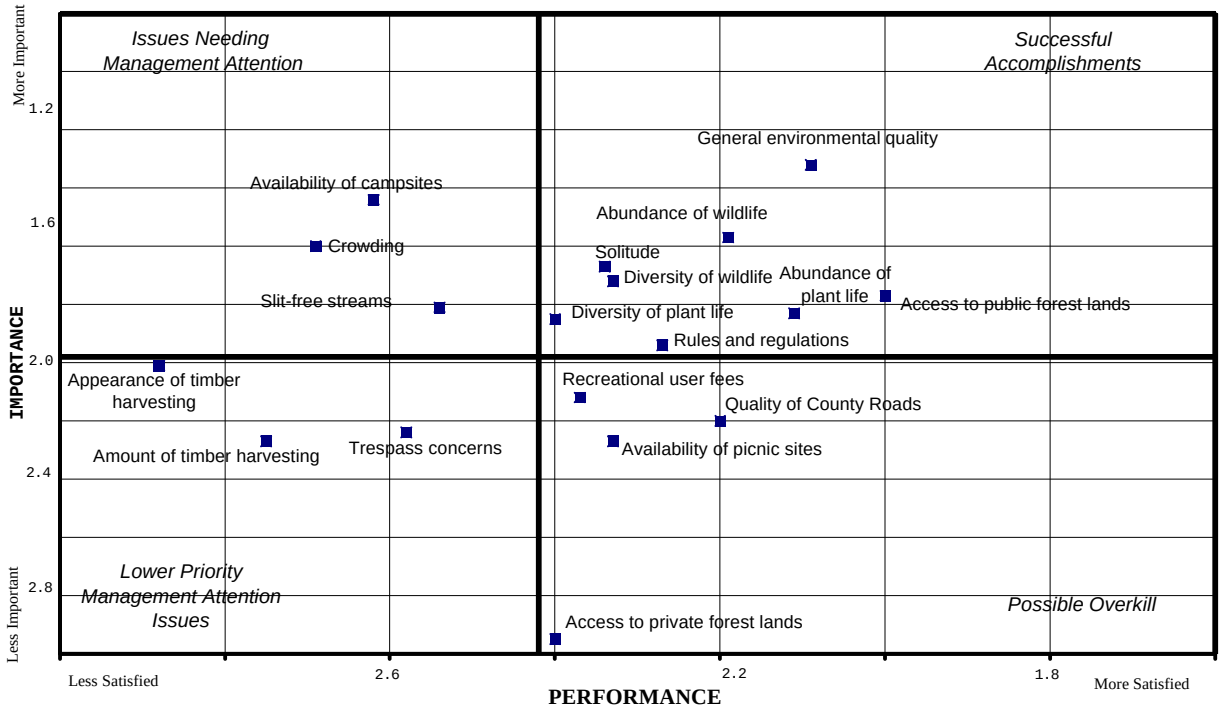

Figure 2-2. Perceptions of campers.

Snowmobiling

The recreation participation of snowmobilers is summarized in Table 3-1. For high involvement snowmobilers, watching wildlife is the most popular secondary activity, followed by hunting and fishing. Medium involvement snowmobilers replied that fishing and hunting were their most common secondary activities. Low involvement snowmobilers were generally inactive in other activities, but spent the most time fishing, hunting, and watching wildlife.

Compatibility ratings provided by snowmobilers are illustrated in Figure 3-1. Snowmobilers gave neutral to compatible scores to primitive camping, hiking/skiing, and hunting. Auto-camping, use of animals, and bicycling were given neutral to incompatible scores.

Snowmobilers indicated how their recreation days are allocated among the four seasons and these responses are summarized in Table 3-2. As one might expect, wintertime is the season when snowmobilers are most active. Summer is the second most popular season for activities; snowmobile riders are least likely to participate in outdoor recreation in the spring.

The percentages of time spent on the various land classifications are summarized in Table 3-3. Across involvement categories, private land was found to be the most common landownership type used by snowmobilers. State and federal land are also important as recreational resources.

Regional preferences of snowmobilers are summarized in Table 3-4. The northeast and northwest areas were selected by all involvement categories as the most popular area for snowmobiling. The southeast portion of the state was most popular among medium involvement snowmobilers, while the southwest was most popular among low involvement riders.

The reported spending habits provided by snowmobilers are summarized in Table 3-5. Recreational equipment was by far the largest expenditure for all involvement categories, with spending on equipment exceeding the amount spent on all other goods and services combined. High and low involvement categories spent more on restaurants/drinks than the remaining items, while medium involvement snowmobilers spent more on gas/auto service. More than half the total amount spent on restaurants/drinks is spent within 25 miles of snowmobile destinations.

The IPA ratings provided by snowmobilers are illustrated in Figure 3-2. Only two issues were identified by snowmobilers as needing management attention: abundance of wildlife and rules and regulations. A number of items also received high importance and performance scores and were labeled as “successful management accomplishments”: diversity of wildlife, access to public forest lands, and general environmental qualities. Compared to other user groups, snowmobilers gave low importance scores to many forest attributes.

Table 3-1. Recreational activities of snowmobilers by snowmobiling involvement category.

Activity	Snowmobiling Involvement Category (# of snowmobiling days/yr.)					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean use	s	Mean use	s	Mean use	s
All-terrain motorized vehicle	.22 (n= 27)	.80	2.66 (n= 84)	8.73	6.71 (n=80)	16.74
Off-road bicycling	.15 (n= 27)	.77	.32 (n= 84)	1.46	3.48 (n=80)	14.96
Camping	.26 (n= 27)	1.35	2.48 (n= 84)	4.16	4.06 (n=80)	8.88
Fishing	1.44 (n= 27)	3.25	7.16 (n= 84)	14.62	14.10 (n=80)	21.82
Hiking	.33 (n= 27)	.92	1.23 (n= 84)	3.55	4.44 (n=80)	20.72
Horseback riding	.00 (n= 27)	.00	.51 (n= 84)	1.92	.78 (n=80)	4.71
Hunting	1.33 (n= 27)	2.48	5.08 (n= 84)	6.45	14.91 (n=80)	24.64
Pack Animal Use	.00 (n= 27)	.00	.00 (n= 84)	.00	.00 (n=80)	.00
Plant collecting	.00 (n= 27)	.00	.13 (n= 84)	.48	.03 (n=80)	.22
Cross-country skiing	.22 (n= 27)	.83	.24 (n= 84)	.80	1.03 (n=80)	4.83
Snowmobiling	3.44 (n= 27)	1.76	13.86 (n= 84)	5.03	39.75 (n=80)	18.92
Watching wildlife	1.37 (n= 27)	5.81	2.94 (n= 84)	5.30	18.64 (n=80)	62.45

- indicates no representative cases

Table 3-2. Seasonal incidence of forest-based recreation by snowmobiling involvement category.

Season	Snowmobiling Involvement Category (# of snowmobiling days/season)					
	LOW (0–5 days)		MED(6-20 days)		HIGH(>20days)	
	Mean use	s	Mean use	s	Mean use	s
Fall	1.46 (n=26)	2.21	8.15 (n=83)	9.60	17.06 (n=80)	20.29
Summer	1.12 (n=26)	1.53	9.88 (n=83)	12.14	18.78 (n=78)	24.31
Spring	.39 (n=26)	.90	3.01 (n=83)	5.12	5.97 (n=78)	10.16
Winter	3.77 (n=26)	2.12	15.48 (n=82)	5.87	39.56 (n=79)	23.38

- indicates no representative cases

Table 3-3. Ownership of land used by snowmobiling involvement category.

Landownership	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	s	Mean %	s	Mean %	s
Public:						
City / municipal land	.83 (n=24)	2.81	.89 (n=79)	3.90	.80 (n=78)	1.99
County land	8.25 (n=24)	14.99	10.84 (n=79)	19.73	6.58 (n=78)	11.04
State land	17.08 (n=24)	25.06	15.17 (n=79)	21.65	15.37 (n=78)	18.75
Federal Land	15.21 (n=24)	28.41	15.54 (n=79)	24.45	15.47 (n=78)	23.31
Public Land	16.25 (n=24)	37.16	16.82 (n=79)	26.27	11.80 (n=78)	25.43
Private:						
Private land not owned by the timber industry	14.46 (n=24)	29.74	20.13 (n=79)	23.12	28.96 (n=78)	31.54
Private land owned by the timber industry	6.67 (n=24)	17.36	8.52 (n=79)	17.15	5.65 (n=78)	9.74
Private land	12.50 (n=24)	22.88	10.32 (n=79)	18.05	11.86 (n=78)	23.11

- indicates no representative cases

Table 3-4. Distribution of forest-based recreational use by snowmobiling involvement category across Wisconsin regions.

Region	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	S	Mean %	s	Mean %	s
Central	.14 (n=21)	.36	.37 (n=75)	.49	.32 (n=73)	.47
Northeast	.71 (n=21)	.46	.71 (n=75)	.46	.70 (n=73)	.46
Northwest	.57 (n=21)	.51	.53 (n=75)	.50	.64 (n=73)	.48
Southeast	.24 (n=21)	.43	.32 (n=75)	.47	.16 (n=73)	.37
Southwest	.33 (n=21)	.48	.13 (n=75)	.34	.18 (n=73)	.38

- indicates no representative cases

Table 3-5. Annual household recreational expenditure patterns by snowmobiling involvement category.

Spending Category	Dollar amount spent for recreation purposes					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Global $	Local $	Global $	Local $	Global $	Local $
Gas / Auto Service	99.13 (n=23)	65.72	321.52 (n=82)	178.80	352.40 (n=78)	190.08
Casino	16.52 (n=23)	1.44	37.38 (n=82)	6.47	60.71 (n=78)	13.40
Rec. Equipment	1310.74 (n=23)	389.29	3384.76 (n=82)	970.75	3288.72 (n=78)	1301.68
User Fees	5.34 (n=23)	1.18	26.42 (n=82)	8.86	22.23 (n=78)	4.94
Groceries	60.87 (n=23)	28.32	222.56 (n=82)	120.38	240.32 (n=78)	123.36
Overnight Stays	103.26 (n=23)	44.44	199.38 (n=82)	77.36	118.08 (n=78)	38.91
Licenses	28.70 (n=23)	7.24	51.84 (n=82)	19.69	84.68 (n=78)	40.35
Recreation	12.61 (n=23)	2.74	52.87 (n=82)	14.03	83.01 (n=78)	27.50
Restaurants / Drinks	122.39 (n=23)	70.78	238.02 (n=82)	155.40	371.94 (n=78)	216.95
Other Retail	7.39 (n=23)	0.80	113.48 (n=82)	44.14	131.92 (n=78)	38.01
Property Tax	282.61 (n=23)	31.93	289.85 (n=82)	44.17	171.54 (n=78)	23.96

- indicates no representative cases

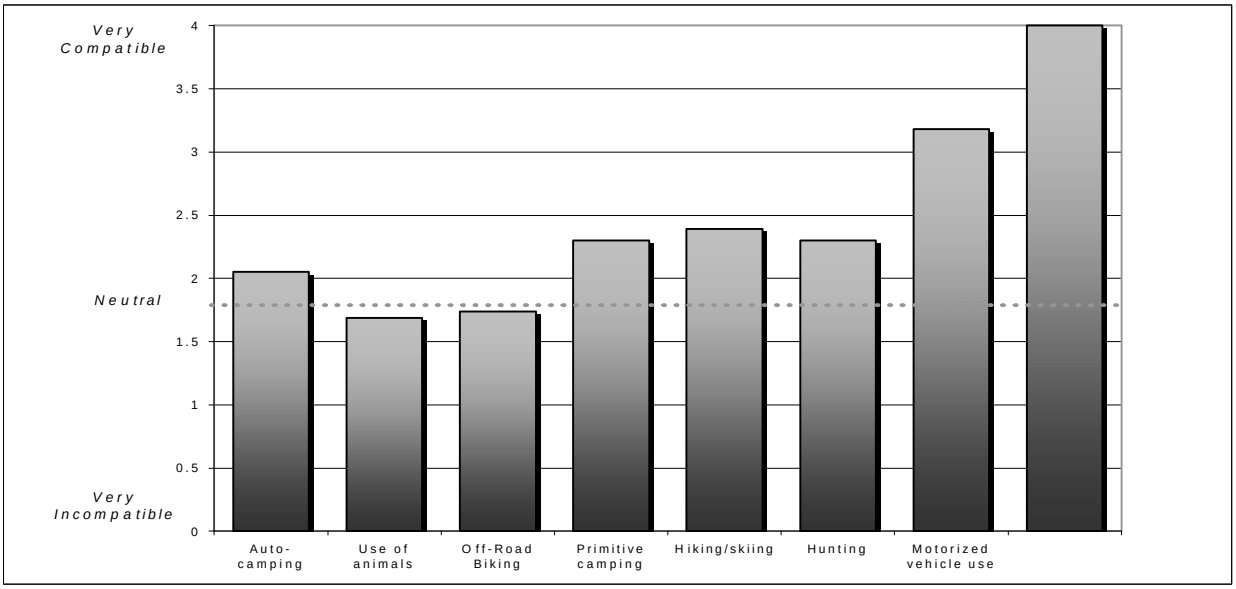

Figure 3-1. Compatibility of snowmobilers with seven activities.

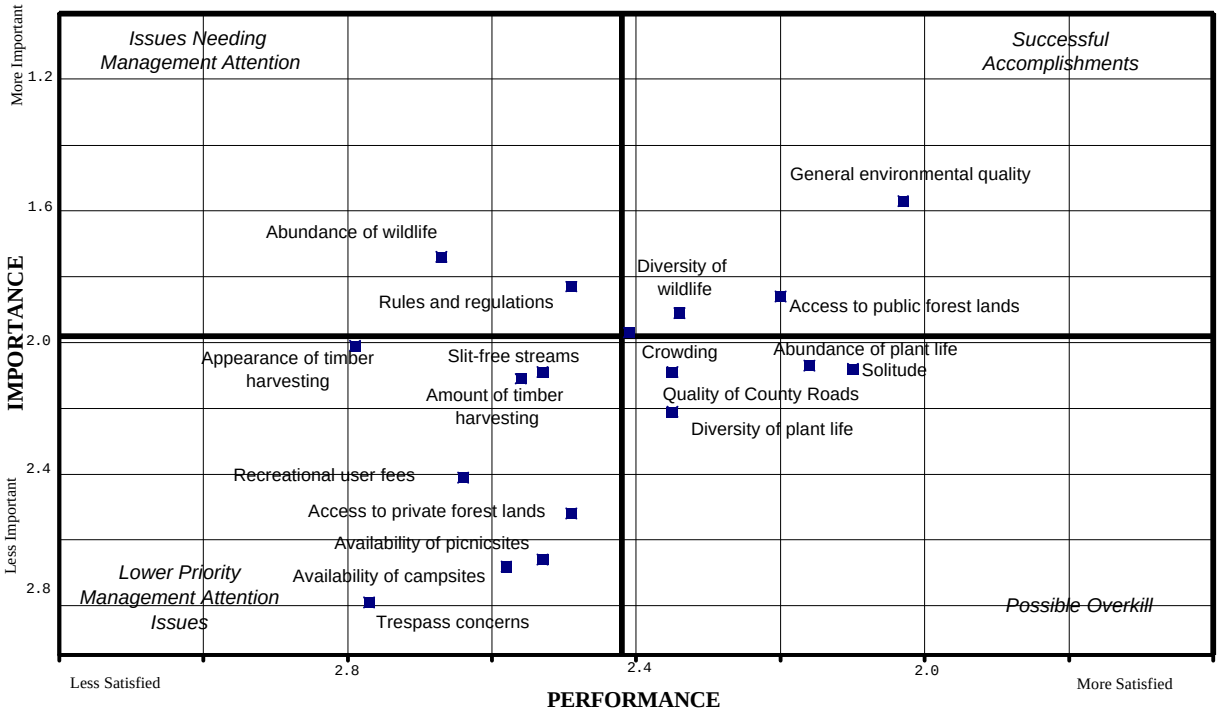

Figure 3-2. Perceptions of snowmobilers.

Hiking

Secondary activities of those respondents who selected hiking as their primary forest-based recreational activity are summarized in Table 4-1. Watching wildlife was identified as a popular secondary activity by all involvement categories. Camping and off-road bicycling were also reported as alternative activities which hikers participated in.

Respondents ranked other recreational activities based on their compatibility with hiking. The results of this portion of the survey are illustrated in Figure 4-1. Hikers gave the highest compatibility ratings to hiking/skiing and to primitive camping. Neutral to compatible scores were given to auto camping, use of animals, and bicycling. Neutral to incompatible scores were given to hunting and motorized vehicle use.

Seasonal preferences of hikers are summarized in Table 4-2. Responses were very similar across involvement categories, with summer receiving the greatest allocation. Fall averaged about three-quarters the number of days allocated to summer, while spring and winter each received about half as many days as summer.

Landownership classifications for recreational sites of hikers are summarized in Table 4-3. State land received the largest percentage allocation across involvement categories. State land was particularly popular among medium involvement hikers who indicated that they spent 43% of their recreating days on state land. Private land not owned by the timber industry was listed as the second most popular landownership type used by hikers, followed by county land. High involvement hikers reported spending, on average, over 30% of their recreation time on private land not owned by the timber industry.

Regional preferences for hikers are summarized in Table 4-4. The location where respondents reported hiking varied based upon their level of involvement. The southwest was most often indicated as a hiking destination by both high and low involvement hikers, while the southeast received the most visits from medium involvement hikers. The northwest received a low level of visits by all involvement groups except for the high involvement hikers.

The results of the spending portion of the survey are summarized for hikers Table 4-5. Like most other outdoor recreation activities, hikers reported allocating the majority of their recreation dollar on equipment. Groceries and gas/auto service also ranked high for spending. When examining the amount spent locally, the same categories emerge as major spending items.

The IPA analysis for hikers can be seen in Figure 4-2. Hikers gave high importance scores to many forest qualities, and gave low performance scores to timber harvesting appearance and amount, crowding, trespass concerns, and diversity of wildlife.

Table 4-1. Recreational activities of hikers by hiking involvement category.

Activity	Hiking Involvement Category (# of hiking days/yr.)					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean use	s	Mean use	s	Mean use	s
All-terrain motorized vehicle	.91 (n= 35)	2.65	.00 (n=23)	.00	.84 (n=25)	3.11
Off-road bicycling	1.89 (n= 35)	3.33	6.44 (n=23)	21.54	6.12 (n=25)	23.89
Camping	4.63 (n= 35)	8.86	5.70 (n=23)	7.33	6.36 (n=25)	11.21
Fishing	2.80 (n= 35)	6.01	2.04 (n=23)	3.64	8.36 (n=25)	23.74
Hiking	1.91 (n= 35)	2.01	12.65 (n= 23)	4.55	75.08 (n=25)	64.81
Horseback riding	.09 (n= 35)	.37	.04 (n=23)	.20	.16 (n=25)	.47
Hunting	2.34 (n= 35)	5.10	.00 (n=23)	.00	4.56 (n=25)	10.35
Pack Animal Use	.57 (n= 35)	3.38	.00 (n=23)	.00	.00 (n=25)	.00
Plant collecting	.34 (n= 35)	1.02	.30 (n=23)	1.46	2.28 (n=25)	6.27
Cross-country skiing	1.31 (n= 35)	3.02	4.22 (n=23)	8.84	4.48 (n=25)	12.42
Snowmobiling	.71 (n= 35)	2.42	.52 (n=23)	1.51	3.48 (n=25)	7.49
Watching wildlife	16.57 (n= 35)	42.78	10.35 (n=23)	12.88	15.64 (n=25)	26.98

- indicates no representative cases

Table 4-2. Seasonal incidence of forest-based recreation by hiking involvement category.

Season	Hiking Involvement Category (# of hiking days/season)					
	LOW (0–5 days)		MED(6-20 days)		HIGH(>20days)	
	Mean use	s	Mean use	s	Mean use	s
Fall	9.18 (n=34)	12.09	7.65 (n=23)	5.92	29.16 (n=25)	23.78
Summer	12.09 (n=35)	16.14	11.65 (n=23)	6.91	44.56 (n=25)	38.11
Spring	6.71 (n=35)	11.80	7.52 (n=23)	7.51	22.36 (n=25)	21.00
Winter	5.80 (n=35)	9.81	6.22 (n=23)	8.67	24.96 (n=25)	34.30

- indicates no representative cases

Table 4-3. Ownership of land used by hiking involvement category.

Landownership	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	s	Mean %	s	Mean %	s
Public:						
City / municipal land	3.99 (n=33)	13.62	4.35 (n=23)	8.35	7.71 (n=24)	15.15
County land	11.97 (n=33)	18.22	10.44 (n=23)	16.01	8.33 (n=24)	14.27
State land	27.46 (n=33)	33.09	43.04 (n=23)	37.83	32.08 (n=24)	36.34
Federal Land	7.58 (n=33)	17.46	5.97 (n=23)	11.28	8.96 (n=24)	21.00
Public Land (unidentified)	15.15 (n=33)	34.19	3.80 (n=23)	10.85	4.17 (n=24)	18.38
Private:						
Private land not owned by the timber industry	22.06 (n=33)	31.88	19.70 (n=23)	30.44	30.67 (n=24)	31.85
Private land owned by the timber industry	3.79 (n=33)	17.54	4.39 (n=23)	11.43	3.54 (n=24)	16.31
Private land (unidentified)	3.64 (n=33)	14.32	3.57 (n=23)	16.66	2.92 (n=24)	8.58

- indicates no representative cases

Table 4-4. Distribution of forest-based recreational use by hiking involvement category across Wisconsin regions.

Region	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	S	Mean %	s	Mean %	s
Central	.42 (n=26)	.50	.38 (n=21)	.50	.48 (n=21)	.50
Northeast	.39 (n=26)	.50	.57 (n=21)	.51	.38 (n=21)	.49
Northwest	.19 (n=26	.40	.14 (n=21)	.36	.38 (n=21)	.49
Southeast	.42 (n=26)	.50	.62 (n=21)	.50	.38 (n=21)	.49
Southwest	.50 (n=26)	.51	.57 (n=21)	.51	.57 (n=21)	.51

- indicates no representative cases

Table 4-5. Annual household recreational expenditure patterns by hiking involvement category.

Spending Category	Dollar amount spent for recreation purposes					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Global $	Local $	Global $	Local $	Global $	Local $
Gas / Auto Service	127.71 (n=34)	48.84	109.57 (n=23)	42.83	116.36 (n=22)	57.91
Casino	22.35 (n=34)	1.64	5.22 (n=23)	0.43	20.68 (n=22)	3.76
Rec. Equipment	1161.62 (n=34)	214.90	204.30 (n=23)	70.71	201.59 (n=22)	87.97
User Fees	39.50 (n=34)	23.53	49.52 (n=23)	24.46	67.55 (n=22)	39.76
Groceries	198.97 (n=34)	69.34	94.78 (n=23)	37.50	146.82 (n=22)	69.08
Overnight Stays	35.29 (n=34)	4.41	27.61 (n=23)	4.80	77.05 (n=22)	21.01
Licenses	106.82 (n=34)	40.69	7.83 (n=23)	1.57	24.68 (n=22)	11.56
Recreation	31.03 (n=34)	9.58	66.04 (n=23)	23.54	13.64 (n=22)	1.86
Restaurants / Drinks	171.32 (n=34)	63.99	131.35 (n=23)	64.14	82.50 (n=22)	49.31
Other Retail	15.88 (n=34)	3.46	35.65 (n=23)	10.70	29.55 (n=22)	8.06
Property Tax	183.94 (n=34)	18.39	380.44 (n=23)	97.58	0.00 (n=22)	0.00

- indicates no representative cases

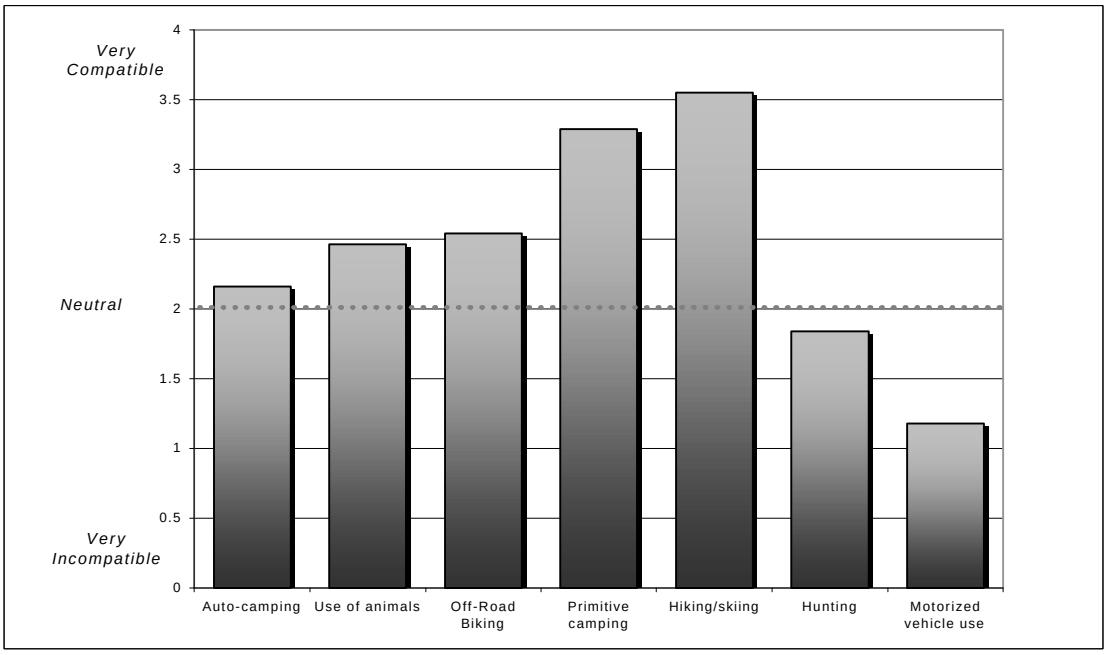

Figure 4-1. Compatibility of hiking with seven activities.

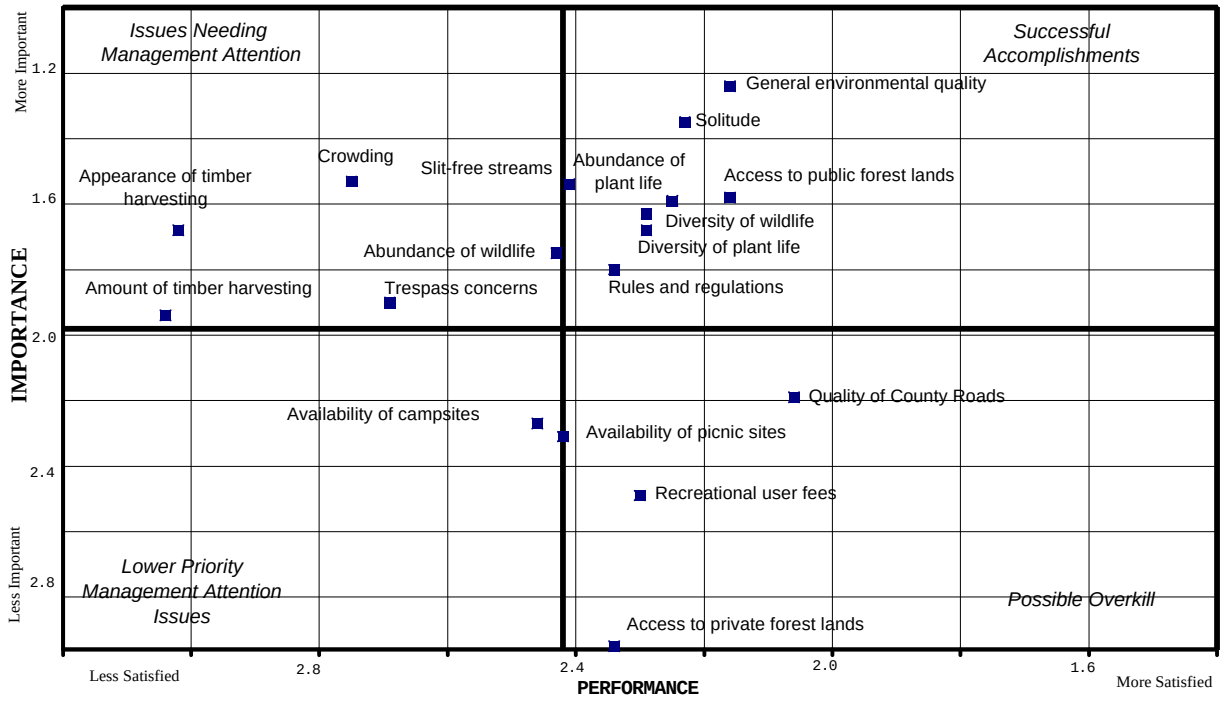

Figure 4-2. Perceptions of hikers.

Fishing

The secondary activities of anglers are summarized in Table 5-1. Hunting, camping and snowmobiling were found to be popular activities among all involvement categories of anglers. Watching wildlife was also popular among high and medium involvement anglers.

The compatibility ratings given by anglers are illustrated in Figure 5-1. In general, anglers described their activity and being neutral to compatible with all other activities listed in the question. They gave highest compatibility ratings to primitive camping, motorized vehicle use, and auto-camping.

The seasonal preferences of anglers are presented in Table 5-2. Summer was most popular for forest-based anglers, followed by fall. High involvement anglers were almost equally as active in the fall as they were in the winter.

Landownership classifications for sites visited by anglers are summarized in Table 5-3. From this Table, one can see that there is variation depending on the number of days the respondents spent fishing. High involvement anglers allocate the most time to private land, followed by unclassified public land and state land. Medium involvement anglers placed larger percentages in state land, followed by county land and unclassified public land. Low involvement anglers, meanwhile, were most likely to recreate on either state land or private land.

The geographic preferences provided by anglers are shown in Table 5-4. All respondents indicated a preference for the northeast and northwest sections of the state. Medium involvement anglers also indicated that they spent time fishing in the southeast portion of the state.

The spending habits of anglers are summarized in Table 5-5. As with many other activities, recreation equipment emerged as the highest spending category. Property tax was also reported as a high cost item, and the amount spent for property tax diminished as involvement increased. These two items, together with groceries, gas / auto service and restaurants / drinks, made up the majority of the angler's budget. Local spending for these items was also highest among the various categories.

The IPA results for fishing respondents are illustrated in Figure 5-2. Appearance of timber harvesting, crowding, silt-free streams and trespass concerns emerged as high importance, low satisfaction items. Anglers were found to be most satisfied with the abundance of plant and wildlife. A number of forest qualities were found to be relatively unimportant for anglers, including availability of picnic and campsites.

Table 5-1. Recreational activities of anglers by fishing involvement category.

Activity	Fishing Involvement Category (# of fishing days/yr.)					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean use	s	Mean use	s	Mean use	s
All-terrain motorized vehicle	.00 (n= 10)	.00	.71 (n=17)	2.44	2.56 (n=18)	5.27
Off-road bicycling	.20 (n= 10)	.63	.82 (n=17)	2.45	.94 (n=18)	1.92
Camping	2.70 (n= 10)	4.62	3.00 (n=17)	4.25	6.17 (n=18)	7.78
Fishing	1.70 (n= 10)	2.00	13.71 (n=17)	4.97	33.89 (n=18)	9.25
Hiking	.44 (n= 9)	.88	1.18 (n=17)	2.48	2.50 (n=18)	5.15
Horseback riding	.90 (n= 10)	2.84	.59 (n=17)	2.43	.00 (n=18)	.00
Hunting	3.70 (n= 10)	9.37	2.47 (n=17)	3.50	12.00 (n=18)	11.41
Pack Animal Use	.00 (n= 10)	.00	.00 (n=17)	.00	.00 (n=18)	.00
Plant collecting	.00 (n= 10)	.00	.00 (n=17)	.00	.00 (n=18)	.00
Cross-country skiing	.00 (n= 10)	.00	.41 (n=17)	.87	.50 (n=18)	.92
Snowmobiling	2.10 (n= 10)	3.14	3.53 (n=17)	6.06	7.72 (n=18)	9.99
Watching wildlife	.00 (n= 10)	.00	2.82 (n=17)	7.36	5.67 (n=18)	7.79

- indicates no representative cases

Table 5-2. Seasonal incidence of forest-based recreation by fishing involvement category.

Season	Fishing Involvement Category (# of fishing days/season)					
	LOW (0–5 days)		MED(6-20 days)		HIGH(>20days)	
	Mean use	s	Mean use	s	Mean use	s
Fall	6.50 (n=10)	12.16	7.06 (n=17)	4.51	21.79 (n=19)	15.21
Summer	6.90 (n=10)	5.63	11.94 (n=17)	7.75	29.90 (n=19)	24.93
Spring	1.00 (n=10)	3.16	5.59 (n=17)	4.85	7.42 (n=19)	6.88
Winter	3.60 (n=10)	5.04	4.41 (n=17)	6.07	19.32 (n=19)	16.06

- indicates no representative cases

Table 5-3. Ownership of land used by fishing involvement category.

Landownership	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	s	Mean %	s	Mean %	s
Public:						
City / municipal land	1.00 (n=10)	3.16	1.88 (n=16)	4.03	2.28 (n=18)	6.31
County land	14.50 (n=10)	24.77	15.31 (n=16)	25.05	6.06 (n=18)	10.21
State land	29.50 (n=10)	25.76	38.13 (n=16)	33.26	14.33 (n=18)	25.37
Federal Land	1.50 (n=10)	4.74	9.69 (n=16)	17.17	5.83 (n=18)	23.12
Public Land (unidentified)	7.00 (n=10)	11.95	12.81 (n=16)	27.68	14.50 (n=18)	27.05
Private:						
Private land not owned by the timber industry	24.50 (n=10)	34.99	12.18 (n=16)	23.06	41.00 (n=18)	32.79
Private land owned by the timber industry	10.00 (n=10)	31.62	.00 (n=16)	.00	3.89 (n=18)	15.29
Private land (identified)	3.00 (n=10)	7.88	6.67 (n=16)	22.14	9.78 (n=18)	26.01

- indicates no representative cases

Table 5-4. Distribution of forest-based recreational use by fishing involvement category across Wisconsin regions.

Region	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	s	Mean %	s	Mean %	s
Central	.22 (n=9)	.44	.24 (n=17)	.44	.22 (n=18)	.43
Northeast	.67 (n=9)	.50	.77 (n=17)	.44	.50 (n=18)	.51
Northwest	.56 (n=9)	.53	.47 (n=17)	.51	.56 (n=18)	.51
Southeast	.33 (n=9)	.50	.53 (n=17)	.51	.22 (n=18)	.43
Southwest	.00 (n=9)	.00	.12 (n=17)	.33	.11 (n=18)	.32

- indicates no representative cases

Table 5-5. Annual household recreational expenditure patterns by fishing involvement category.

Spending Category	Dollar amount spent for recreation purposes					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Global $	Local $	Global $	Local $	Global $	Local $
Gas / Auto Service	105.63 (n=8)	73.29	200.00 (n=16)	103.12	281.67 (n=18)	158.05
Casino	40.00 (n=8)	20.00	13.13 (n=16)	1.64	145.03 (n=18)	45.12
Rec. Equipment	412.50 (n=8)	146.97	1280.31 (n=16)	488.18	705.28 (n=18)	368.30
User Fees	19.63 (n=8)	8.59	20.63 (n=16)	9.08	51.83 (n=18)	16.84
Groceries	193.75 (n=8)	107.78	276.56 (n=16)	159.55	377.22 (n=18)	203.28
Overnight Stays	77.50 (n=8)	38.75	167.88 (n=16)	65.47	84.44 (n=18)	23.46
Licenses	41.75 (n=8)	20.88	52.94 (n=16)	36.33	76.00 (n=18)	33.77
Recreation	40.63 (n=8)	18.03	28.13 (n=16)	9.04	41.11 (n=18)	14.62
Restaurants / Drinks	114.38 (n=8)	97.22	212.50 (n=16)	143.97	211.94 (n=18)	151.30
Other Retail	49.38 (n=8)	6.17	89.19 (n=16)	54.85	122.50 (n=18)	60.23
Property Tax	487.50 (n=8)	121.88	425.00 (n=16)	106.25	316.39 (n=18)	105.45

- indicates no representative cases

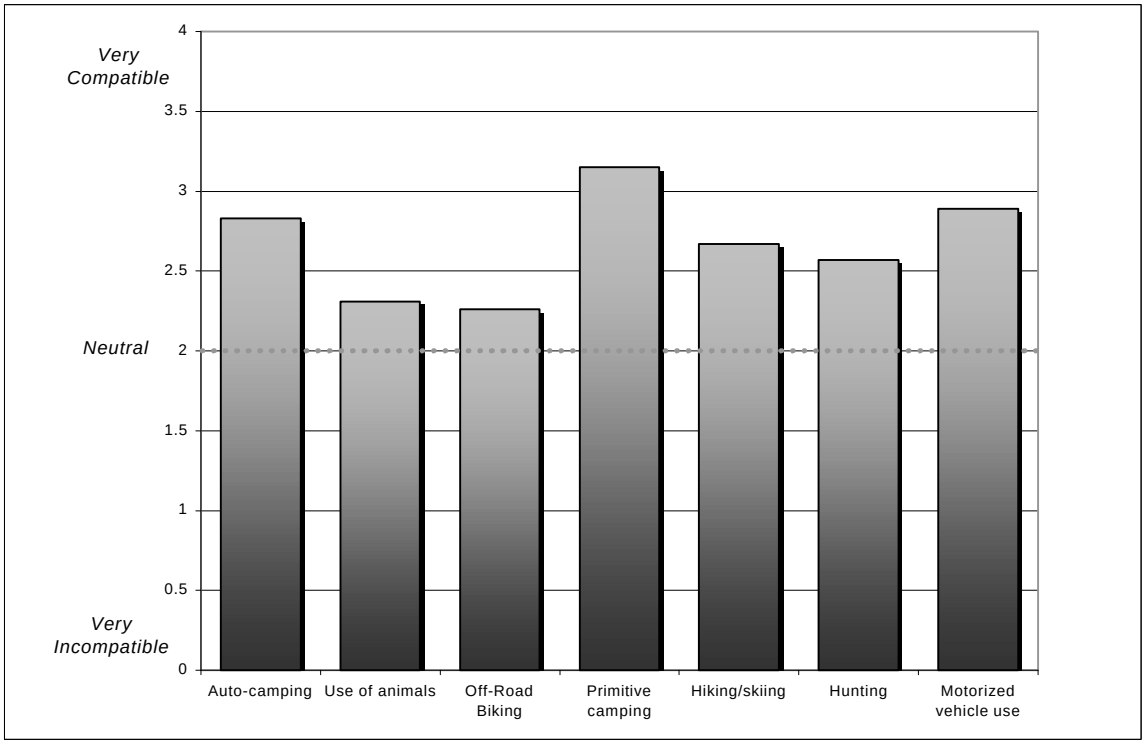

Figure 5-1. Compatibility of fishing with seven activities.

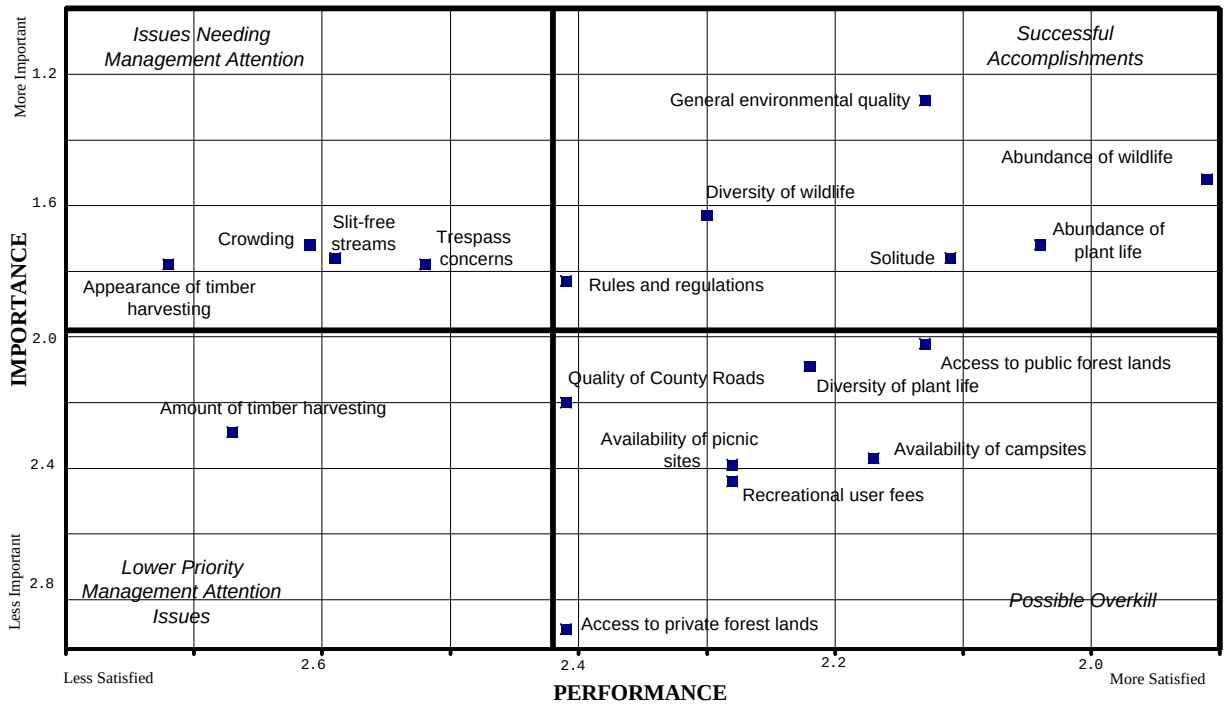

Figure 5-2. Perception of anglers.

All Terrain Motor Vehicle (ATMV)

The secondary activities of primarily ATMV participants are summarized in Table 6-1. Watching wildlife, snowmobiling, hunting and fishing were all mentioned as alternative or simultaneous activities enjoyed in addition to ATMV riding. Camping and hiking were also listed as activities enjoyed by ATMV riders, although they were not found to be as popular as the three activities mentioned earlier.

The compatibility scores given to other recreational activities by ATMV participants can be seen in Figure 6-1. Motorized vehicle use and auto-camping were seen as the most compatible, while the other activities listed in the survey question all received neutral-to-compatible ratings. The use of animals (horses, dogs) received the lowest compatibility rating, but the activity did not receive below "neutral" ratings.

When asked to allocate their recreation days to the four seasons, ATMV riders selected the summertime as their most active time of year. These results can be seen in Table 6-2. The fall and winter months were also popular for ATMV riders, while spring was the least selected season for recreation. The higher incidence of wintertime activity may reflect the group's higher participation in snowmobiling and watching wildlife.

The landownership classifications of ATMV recreation sites are summarized in Table 6-3. Private land received the largest allocation of recreation time from all involvement categories. High involvement ATMV riders were more likely to be found on county land than other public lands, while low involvement rider allocated high percentages to federal and state lands.

The regional preferences of ATMV participants are summarized in Table 6-4. The northwest area of Wisconsin received the most visits from primary ATMV participants. The northeast portion of the state was also popular among medium and high involvement ATMV risers, while low involvement participants indicated the central portion of Wisconsin as a recreation destination.

The Reported spending by ATMV participants on various categories can be seen in Table 6-5. Recreation equipment emerges as the major spending category. This is consistent with the majority of activities discussed in this paper. ATMV riders also reported spending much of their recreation dollar on other retail, gas/auto service, groceries, and overnight stays.

ATMV riders were asked to rate several issues for both importance and satisfaction, illustrated in Figure 6-2. Appearance and amount of timber harvests, as well as trespass concerns, were found to be issues of relatively high importance and low satisfaction among ATMV participants. User fees and land access were found to be "lower priority management issues" meaning that while ATMV riders may not be satisfied with these issues, they also deem them relatively less important than other issues.

Table 6-1. Recreational activities of all-terrain motorized vehicle(ATMV) users by ATMV involvement category.

Activity	ATMV Involvement Category (# of ATMV days/yr.)					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean use	s	Mean use	s	Mean use	s
All-terrain motorized vehicle	1.75	2.36	13.44	5.77	59.62	36.27
	(n= 4)		(n= 9)		(n=21)	
Off-road bicycling	.00	.00	.00	.00	.19	.60
	(n= 5)		(n= 9)		(n=21)	
Camping	2.00	4.47	3.78	4.27	5.00	6.55
	(n= 5)		(n= 9)		(n=21)	
Fishing	.00	.00	4.56	5.65	10.29	19.35
	(n= 5)		(n= 9)		(n=21)	
Hiking	.00	.00	1.89	3.72	4.52	11.34
	(n= 5)		(n= 9)		(n=21)	
Horseback riding	.00	.00	.00	.00	1.14	3.07
	(n= 5)		(n= 9)		(n=21)	
Hunting	.75	1.50	7.00	7.23	5.71	6.43
	(n= 4)		(n= 9)		(n=21)	
Pack Animal Use	.00	.00	.00	.00	.00	.00
	(n= 5)		(n= 9)		(n=21)	
Plant collecting	.00	.00	.00	.00	.57	2.18
	(n= 5)		(n= 9)		(n=21)	
Cross-country skiing	.00	.00	.00	.00	.10	.44
	(n= 5)		(n= 9)		(n=21)	
Snowmobiling	.50	1.00	6.22	12.13	16.29	26.86
	(n= 4)		(n= 9)		(n=21)	
Watching wildlife	1.00	2.23	6.67	11.17	17.76	32.87
	(n= 5)		(n= 9)		(n=21)	

- indicates no representative cases

Table 6-2. Seasonal incidence of forest-based recreation by ATMV involvement category.

Season	ATMV Involvement Category (# of ATMV use days/season)					
	LOW (0–5 days)		MED(6-20 days)		HIGH(>20days)	
	Mean use	S	Mean use	s	Mean use	s
Fall	4.60	8.71	12.67	8.44	27.38	18.79
	(n=5)		(n=9)		(n=21)	
Summer	4.80	5.98	12.33	8.17	38.29	26.46
	(n=5)		(n=9)		(n=21)	
Spring	1.40	2.19	4.78	7.07	19.14	15.76
	(n=5)		(n=9)		(n=21)	
Winter	1.60	2.30	12.67	12.67	27.76	24.11
	(n=5)		(n=9)		(n=21)	

- indicates no representative cases
-

Table 6-3. Ownership of land used by ATMV involvement category.

Landownership	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	s	Mean %	s	Mean %	s
Public:						
City / municipal land	.00 (n=8)	.00	1.25 (n=8)	3.53	.48 (n=21)	2.17
County land	6.25 (n=8)	11.87	8.75 (n=8)	12.46	21.62 (n=21)	24.47
State land	21.25 (n=8)	36.42	15.63 (n=8)	15.45	9.95 (n=21)	13.74
Federal Land	18.75 (n=8)	33.99	16.25 (n=8)	17.67	10.14 (n=21)	15.45
Public Land (unidentified)	3.75 (n=8)	5.17	25.63 (n=8)	34.13	9.48 (n=21)	24.61
Private:						
Private land not owned by the timber industry	21.25 (n=8)	40.15	7.50 (n=8)	17.52	34.43 (n=21)	35.20
Private land owned by the timber industry	3.75 (n=8)	7.44	1.25 (n=8)	3.54	10.57 (n=21)	17.20
Private land (unidentified)	23.75 (n=8)	41.03	23.75 (n=8)	27.35	11.67 (n=21)	26.23

- indicates no representative cases

Table 6-4. Distribution of forest-based recreational use by ATMV involvement category across Wisconsin regions.

Region	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	S	Mean %	s	Mean %	s
Central	.50 (n=8)	.54	.14 (n=7)	.38	.31 (n=19)	.48
Northeast	.25 (n=8)	.46	.43 (n=7)	.54	.47 (n=19)	.51
Northwest	.50 (n=8)	.54	.57 (n=7)	.54	.63 (n=19)	.50
Southeast	.13 (n=8)	.35	.43 (n=7)	.54	.32 (n=19)	.48
Southwest	.13 (n=8)	.35	.43 (n=7)	.54	.26 (n=19)	.45

- indicates no representative cases

Table 6-5. Annual household recreational expenditure patterns by ATMV involvement category.

Spending Category	Dollar amount spent for recreation purposes					
	LOW (0–5 days / yr.)		MED. (6-20 days / yr.)		HIGH (> 20 days / yr.)	
	Global $	Local $	Global $	Local $	Global $	Local $
Gas / Auto Service	280.00 (n=6)	140.03	244.44 (n=9)	143.95	448.68 (n=19)	294.02
Casino	33.33 (n=6)	4.17	11.11 (n=9)	2.47	36.84 (n=19)	6.79
Rec. Equipment	885.00 (n=6)	147.53	1631.11 (n=9)	670.55	3018.42 (n=19)	1564.75
User Fees	27.50 (n=6)	5.73	38.89 (n=9)	8.64	52.58 (n=19)	18.27
Groceries	278.33 (n=6)	81.19	238.33 (n=9)	111.23	388.95 (n=19)	245.66
Overnight Stays	236.67 (n=6)	106.50	116.67 (n=9)	12.96	252.63 (n=19)	73.79
Licenses	28.33 (n=6)	9.44	50.78 (n=9)	16.65	69.26 (n=19)	36.27
Recreation	36.67 (n=6)	9.17	33.33 (n=9)	4.07	100.00 (n=19)	28.95
Restaurants / Drinks	80.00 (n=6)	43.34	155.00 (n=9)	120.56	257.11 (n=19)	149.54
Other Retail	525.00 (n=6)	133.88	66.67 (n=9)	14.81	623.68 (n=19)	242.92
Property Tax	166.67 (n=6)	27.78	90.00 (n=9)	10.00	288.95 (n=19)	45.63

- indicates no representative cases

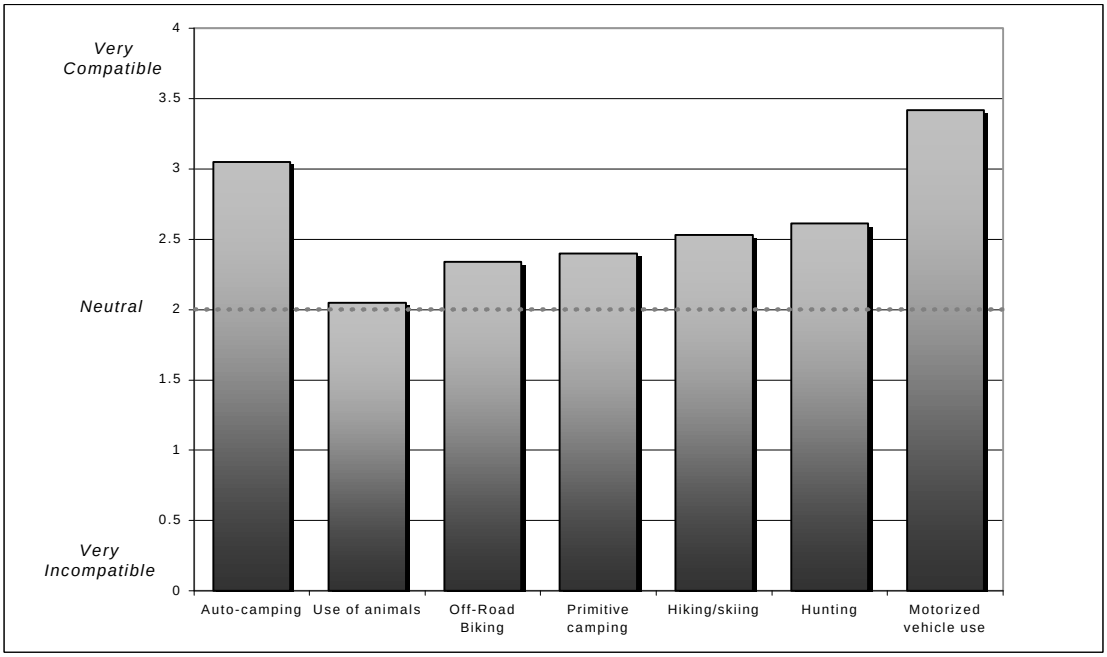

Figure 6-1 Compatibility of ATMV with seven activities.

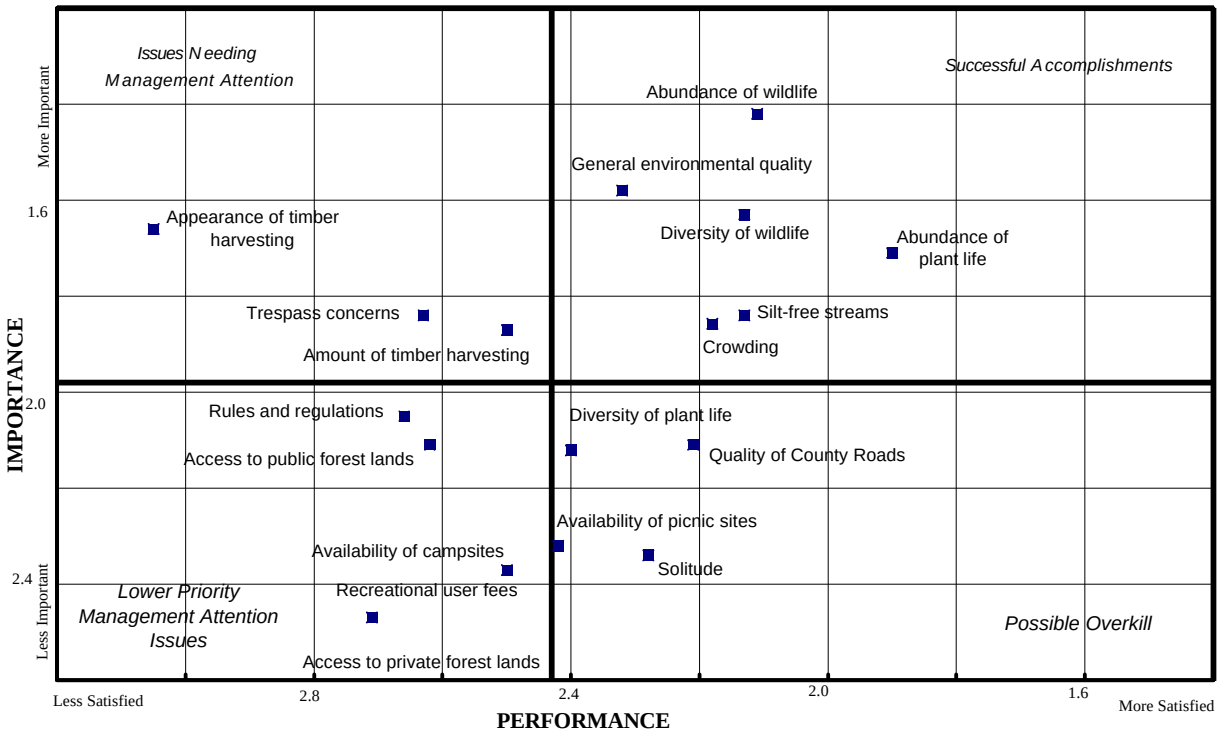

Figure 6-2. Perceptions of ATMV riders.

Watching Wildlife

Table 7-1 summarizes the days spent by wildlife watchers in different forest-based recreational activities. Fishing and hiking were found to be popular secondary activities for respondents who identified themselves as wildlife watchers. Hunting and snowmobiling were also activities identified by wildlife watchers as secondary activities.

When asked to describe the compatibility of other forest uses with their activity, wildlife watchers gave highest scores to bicycling, primitive camping, and hiking / skiing. These results are illustrated in Figure 7-1. Auto-camping, the use of animals such as horses or pack animals, and hunting were all seen as less than compatible, while the use of motorized vehicles received the lowest compatibility score.

The number of days that wildlife watchers spent recreating in the various seasons are shown in Table 7-2. Summer and fall were found to be very popular seasons for all involvement categories. High-involvement wildlife watchers were found to be almost equally active in all four seasons.

Private land was found to be the most popular landownership for all wildlife watching involvement categories. The percentage of time spent by wildlife watchers on various landownership types is illustrated in Table 7-3. County land was found to be the most popular publicly owned land type for wildlife watchers.

The geographic preferences given by wildlife watchers are summarized in Table 7-4. Wildlife watchers were found to be active in many parts of Wisconsin. Among medium involvement participants, the southeast portion of the state was found to be least popular, while high involvement wildlife watchers avoided the northeast and southwest portions of Wisconsin.

Recreation spending habits for wildlife watchers are summarized in Table 7-5. Recreation equipment again emerged as a category for which participants reported spending a significant amount of money. The spending patterns of wildlife watchers were more diffuse than other activities, with significant amounts being spent on property taxes, restaurants / drinks, and groceries.

The IPA portion of the survey results is illustrated in Figure 7-2. Almost all of the issues included in the survey fell into the “priority management issues” category for wildlife watchers. Respondents were found to be relatively satisfied with the abundance of plant life, the quality of county roads, and their access to private forest lands. Respondents were least satisfied with the appearance of timber harvesting.

Table 7-1. Recreational activities of watching wildlife users by watching wildlife involvement category.

Activity	Watching Wildlife Involvement Category (# of watching days/yr.)					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean use	s	Mean use	s	Mean use	s
All-terrain motorized vehicle	.00 (n= 5)	.00	4.17 (n=12)	5.91	.80 (n=15)	3.10
Off-road bicycling	.60 (n= 5)	.89	1.33 (n=12)	2.35	2.33 (n=15)	7.76
Camping	1.40 (n= 5)	3.13	3.08 (n=12)	6.01	3.47 (n=15)	5.50
Fishing	.00 (n= 5)	.00	8.00 (n=12)	11.56	13.73 (n=15)	16.36
Hiking	1.60 (n= 5)	1.51	7.83 (n=12)	9.72	14.13 (n=15)	17.08
Horseback riding	.00 (n= 5)	.00	.42 (n=12)	1.44	.00 (n=15)	.00
Hunting	1.00 (n= 5)	2.24	1.33 (n=12)	1.77	6.80 (n=15)	12.19
Pack Animal Use	.00 (n= 5)	.00	.00 (n=12)	.00	.00 (n=15)	.00
Plant collecting	.00 (n= 5)	.00	.58 (n=12)	.90	.27 (n=15)	.79
Cross-country skiing	.00 (n= 5)	.00	1.17 (n=12)	3.01	1.87 (n=15)	4.48
Snowmobiling	.00 (n= 5)	.00	2.42 (n=12)	5.90	5.53 (n=15)	8.19
Watching wildlife	1.40 (n= 5)	1.95	13.00 (n= 12)	4.81	123.14 (n=15)	106.24

- indicates no representative cases

Table 7-2. Seasonal incidence of forest-based recreation by wildlife watching involvement category.

Season	Wildlife watching Involvement Category (# of watching days/season)					
	LOW (0–5 days)		MED(6-20 days)		HIGH(>20days)	
	Mean use	S	Mean use	s	Mean use	s
Fall	1.40 (n=5)	1.67	11.83 (n=12)	6.81	46.50 (n=16)	28.12
Summer	1.60 (n=5)	1.82	15.58 (n=12)	11.48	43.94 (n=16)	24.31
Spring	1.60 (n=5)	1.52	7.67 (n=12)	6.83	39.63 (n=16)	32.31
Winter	.80 (n=5)	1.78	8.25 (n=12)	12.11	40.75 (n=16)	28.38

- indicates no representative cases

Table 7-3. Ownership of land used by wildlife watching involvement category.

Landownership	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	s	Mean %	s	Mean %	s
Public:						
City / municipal land	.00 (n=4)	.00	5.00 (n=12)	9.05	1.33 (n=18)	2.85
County land	8.25 (n=4)	16.50	19.75 (n=12)	22.97	13.72 (n=18)	16.37
State land	3.00 (n=4)	4.76	11.50 (n=12)	16.91	11.67 (n=18)	10.08
Federal Land	2.50 (n=4)	5.00	4.08 (n=12)	6.11	11.44 (n=18)	19.38
Public Land (unidentified)	8.75 (n=4)	14.36	7.08 (n=12)	24.50	1.17 (n=18)	2.74
Private:						
Private land not owned by the timber industry	5.75 (n=4)	9.61	37.08 (n=12)	38.36	56.11 (n=18)	36.22
Private land owned by the timber industry	.00 (n=4)	.00	.17 (n=12)	.57	6.00 (n=18)	23.04
Private land (unidentified)	24.50 (n=4)	31.56	9.58 (n=12)	28.79	2.89 (n=18)	6.15

- indicates no representative cases

Table 7-4. Distribution of forest-based recreational use by wildlife watching involvement category across Wisconsin regions.

Region	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	s	Mean %	s	Mean %	s
Central	.40 (n=5)	.54	.50 (n=12)	.52	.50 (n=16)	.52
Northeast	.40 (n=5)	.55	.42 (n=12)	.52	.31 (n=16)	.48
Northwest	.40 (n=5)	.54	.42 (n=12)	.52	.69 (n=16)	.48
Southeast	.60 (n=5)	.55	.25 (n=12)	.45	.38 (n=16)	.50
Southwest	.40 (n=5)	.55	.50 (n=12)	.52	.31 (n=16)	.48

- indicates no representative cases

Table 7-5 Annual household recreational expenditure patterns by wildlife watching involvement category.

Spending Category	Dollar amount spent for recreation purposes					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Global $	Local $	Global $	Local $	Global $	Local $
Gas / Auto Service	166.67 (n=3)	55.55	495.00 (n=10)	262.35	292.11 (n=19)	208.33
Casino	0.00 (n=3)	0.00	22.00 (n=10)	4.84	50.79 (n=19)	16.04
Rec. Equipment	675.00 (n=3)	337.50	428.00 (n=10)	216.14	284.21 (n=19)	145.09
User Fees	8.33 (n=3)	2.78	62.50 (n=10)	43.75	17.47 (n=19)	3.95
Groceries	16.67 (n=3)	5.56	222.50 (n=10)	81.21	301.05 (n=19)	198.84
Overnight Stays	0.00 (n=3)	0.00	100.00 (n=10)	25.00	62.63 (n=19)	19.78
Licenses	16.67 (n=3)	5.56	28.80 (n=10)	19.44	48.79 (n=19)	34.15
Recreation	0.00 (n=3)	0.00	44.00 (n=10)	15.40	38.42 (n=19)	13.65
Restaurants / Drinks	20.00 (n=3)	13.33	177.00 (n=10)	82.31	306.05 (n=19)	223.91
Other Retail	0.00 (n=3)	0.00	25.00 (n=10)	5.00	146.32 (n=19)	65.46
Property Tax	333.33 (n=3)	111.10	320.00 (n=10)	35.20	401.21 (n=19)	63.35

- indicates no representative cases

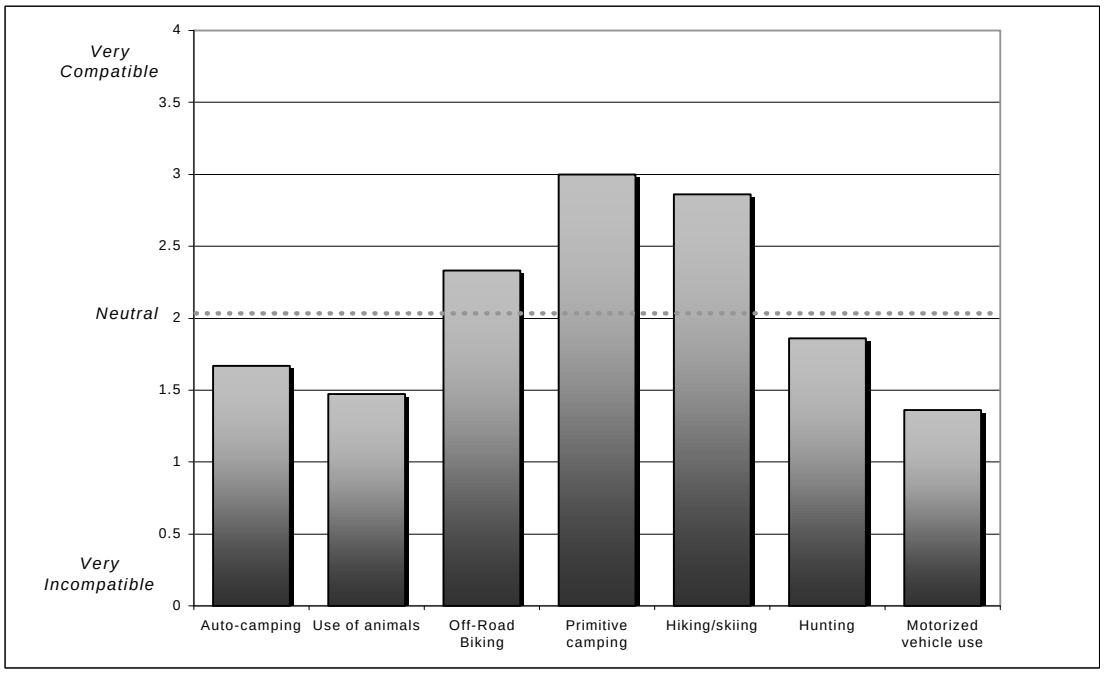

Figure 7-1 Compatibility of wildlife watchers with seven activities.

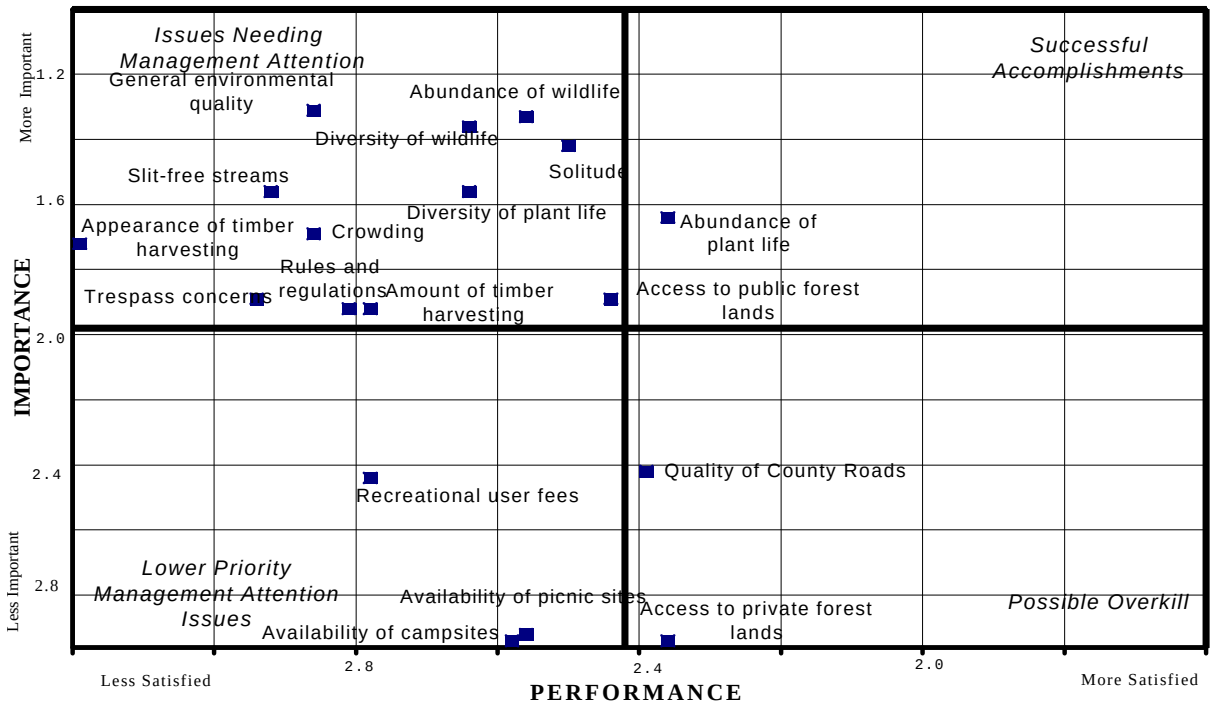

Figure 7-2 Perceptions of wildlife watchers.

Off-road Biking

The secondary activities of off-road cyclists summarized in Table 8-1. High involvement bicyclists reported that hiking was a prominent secondary activity, as did low involvement off-road cyclists. Medium involvement cyclists reported spending time cross country skiing and watching wildlife.

Overall, off-road bicyclists found many forest-based activities to be compatible with their primary activity. The compatibility scores given to different activities by off-road bicycling participants are illustrated in Figure 8-1. Only hunting and motorized vehicle use were reported as incompatible by bicyclists, while hiking / skiing and primitive camping received the highest compatibility ratings.

The seasons in which off-road bicyclists spend their recreation days are summarized in Table 8-2. Overall, summer is the most popular season for off-road bicyclists. Low involvement cyclists reported spending more time recreating in the fall and winter than in the summer, perhaps reflecting their preference for hunting and wildlife watching as secondary activities.

Landownership classifications for off road cyclists' recreation destinations are summarized in Table 8-3. Public land is clearly an important resource for cyclists. High involvement off-road bicyclists reported spending almost 90% of their recreation time on public lands. State land received the greatest allocation of recreation time overall from off-road cyclists.

The portions of the state that off-road cyclists indicated recreating are summarized in Table 8-4. Both the central and southwest portions of the state were popular destinations for off-road cyclists. The northwest and northeast received relatively few visits.

The reported recreation spending by off-road bicyclists is summarized in Table 8-5. In total, bicyclists reported spending far few dollars than other recreation groups. While recreation equipment is again the largest spending category, it is not as dominant for cyclists as it is for other activities.

The IPA ratings given by off-road cyclists are summarized in Figure 8-2. In total, cyclists were found to be satisfied with the issues that they felt were relatively important, and unsatisfied with the issues that were relatively unimportant. No issues fell into the "issues needing management attention" category.

Table 8-1. Recreational activities of off-road bikers by off-road bicycling involvement category.

Activity	Off-road Bicycling Involvement Category (# of biking days/yr.)					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean use	s	Mean use	s	Mean use	s
All-terrain motorized vehicle	.00	.00	.00	.00	.83	2.04
	(n= 7)		(n= 11)		(n= 6)	
Off-road bicycling	1.71	1.89	14.18	4.77	78.33	109.03
	(n= 7)		(n= 11)		(n= 6)	
Camping	2.00	2.31	2.55	4.45	5.33	7.39
	(n= 7)		(n= 11)		(n= 6)	
Fishing	5.29	8.48	1.36	2.62	.00	.00
	(n= 7)		(n= 11)		(n= 6)	
Hiking	5.43	11.16	2.27	3.23	20.00	13.78
	(n= 7)		(n= 11)		(n= 6)	
Horseback riding	.00	.00	.00	.00	.17	.41
	(n= 7)		(n= 11)		(n= 6)	
Hunting	18.57	37.61	1.00	2.32	.00	.00
	(n= 7)		(n= 11)		(n= 6)	
Pack Animal Use	.00	.00	.00	.00	.00	.00
	(n= 7)		(n= 11)		(n= 6)	
Plant collecting	.00	.00	.36	1.21	.17	.41
	(n= 7)		(n= 11)		(n= 6)	
Cross-country skiing	.86	2.27	4.18	6.66	1.67	2.07
	(n= 7)		(n= 11)		(n= 6)	
Snowmobiling	1.43	3.78	2.73	9.05	3.33	8.17
	(n= 7)		(n= 11)		(n= 6)	
Watching wildlife	10.14	14.02	3.36	7.77	5.00	8.37
	(n= 7)		(n= 11)		(n= 6)	

- indicates no representative cases

Table 8-2. Seasonal incidence of forest-based recreation by off-road bicycling involvement category.

Season	Off-road bicycling Involvement Category (# of bicycling days/season)					
	LOW (0–5 days)		MED(6-20 days)		HIGH(>20days)	
	Mean use	s	Mean use	s	Mean use	s
Fall	17.00	21.63	7.09	3.61	29.17	34.41
	(n=7)		(n=11)		(n=6)	
Summer	8.57	10.97	13.18	6.94	39.33	25.90
	(n=7)		(n=11)		(n=6)	
Spring	13.14	16.03	4.73	4.69	25.67	32.35
	(n=7)		(n=11)		(n=6)	
Winter	19.43	44.52	7.46	9.77	17.17	35.75
	(n=7)		(n=11)		(n=6)	

- indicates no representative cases

Table 8-3. Ownership of land used by off-road bicycling involvement category.

Landownership	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	s	Mean %	s	Mean %	s
Public:						
City / municipal land	.83 (n=6)	2.04	2.00 (n=11)	5.44	16.50 (n=6)	22.22
County land	7.50 (n=6)	16.04	15.91 (n=11)	29.84	16.67 (n=6)	31.41
State land	21.67 (n=6)	34.88	56.82 (n=11)	34.42	41.83 (n=6)	42.42
Federal Land	22.50 (n=6)	34.31	3.64 (n=11)	9.24	10.67 (n=6)	17.28
Public Land (unidentified)	16.67 (n=6)	40.82	12.64 (n=11)	23.74	2.83 (n=6)	4.05
Private:						
Private land not owned by the timber industry	1.67 (n=6)	4.07	3.10 (n=11)	5.39	.50 (n=6)	1.22
Private land owned by the timber industry	12.50 (n=6)	30.62	0.00 (n=11)	-	.83 (n=6)	2.04
Private land (unidentified)	0.00 (n=6)	0.00	2.00 (n=11)	6.00	10.17 (n=6)	19.00

- indicates no representative cases

Table 8-4. Distribution of forest-based recreational use by off-road bicycling involvement category across Wisconsin regions.

Region	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	s	Mean %	s	Mean %	s
Central	.67 (n=6)	.52	.27 (n=11)	.47	.60 (n=5)	.55
Northeast	.33 (n=6)	.52	.46 (n=11)	.52	.20 (n=5)	.45
Northwest	.00 (n=6)	.00	.27 (n=11)	.47	.20 (n=5)	.45
Southeast	.50 (n=6)	.55	.46 (n=11)	.52	.40 (n=5)	.55
Southwest	.50 (n=6)	.55	.55 (n=11)	.52	.80 (n=5)	.45

-indicates no representative cases

Table 8-5 Annual household recreational expenditure patterns by off-road bicycling involvement category.

Spending Category	Dollar amount spent for recreation purposes					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Global $	Local $	Global $	Local $	Global $	Local $
Gas / Auto Service	267.14 (n=7)	131.67	114.55 (n=11)	29.68	36.00 (n=5)	12.96
Casino	5.71 (n=7)	0.82	0.00 (n=11)	0.00	10.00 (n=5)	2.00
Rec. Equipment	300.00 (n=7)	21.42	59.09 (n=11)	8.60	174.00 (n=5)	78.30
User Fees	14.29 (n=7)	6.12	105.46 (n=11)	30.68	37.20 (n=5)	25.30
Groceries	108.57 (n=7)	43.43	85.91 (n=11)	21.09	10.00 (n=5)	1.20
Overnight Stays	37.14 (n=7)	14.59	90.91 (n=11)	24.79	29.80 (n=5)	5.96
Licenses	26.43 (n=7)	4.15	15.27 (n=11)	1.39	18.00 (n=5)	7.20
Recreation	2.86 (n=7)	0.41	14.55 (n=11)	1.32	0.00 (n=5)	0.00
Restaurants / Drinks	67.14 (n=7)	28.78	93.64 (n=11)	63.84	26.00 (n=5)	5.33
Other Retail	71.43 (n=7)	0.00	9.46 (n=11)	0.86	0.00 (n=5)	0.00
Property Tax	214.29 (n=7)	0.00	86.36 (n=11)	7.85	0.00 (n=5)	0.00

- indicates no representative cases

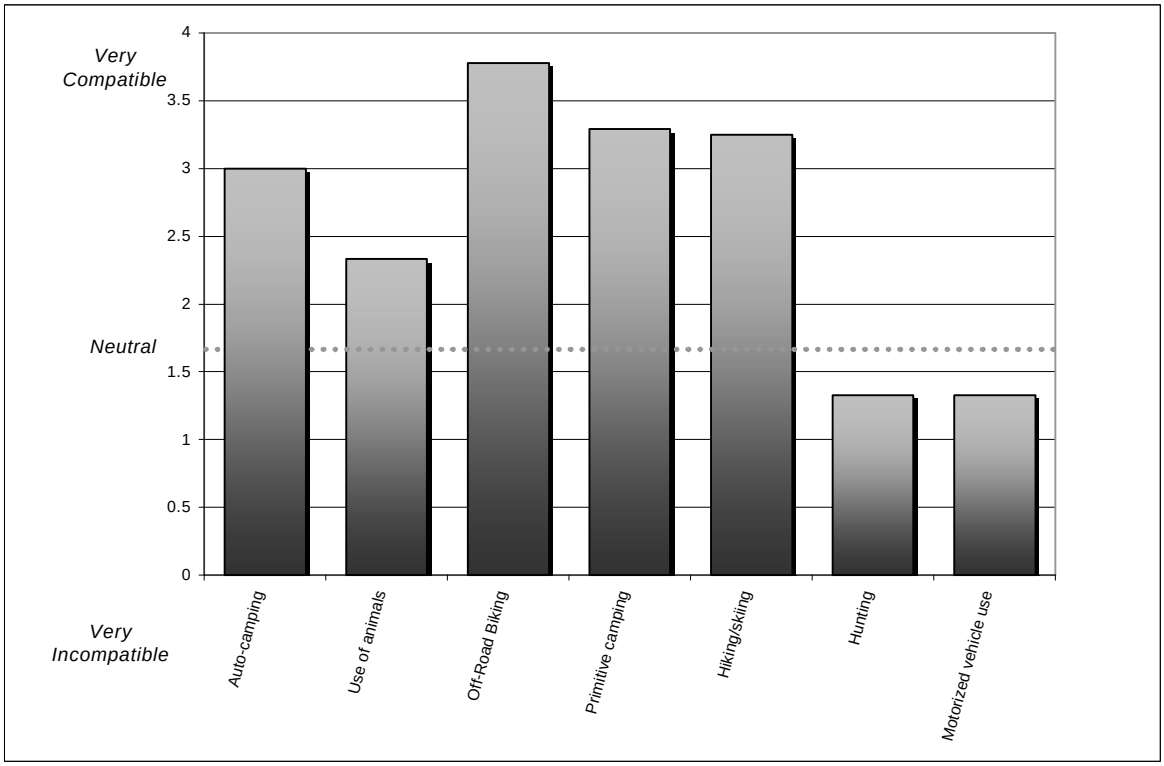

Figure 8-1. Compatibility of off-road biking with seven activities.

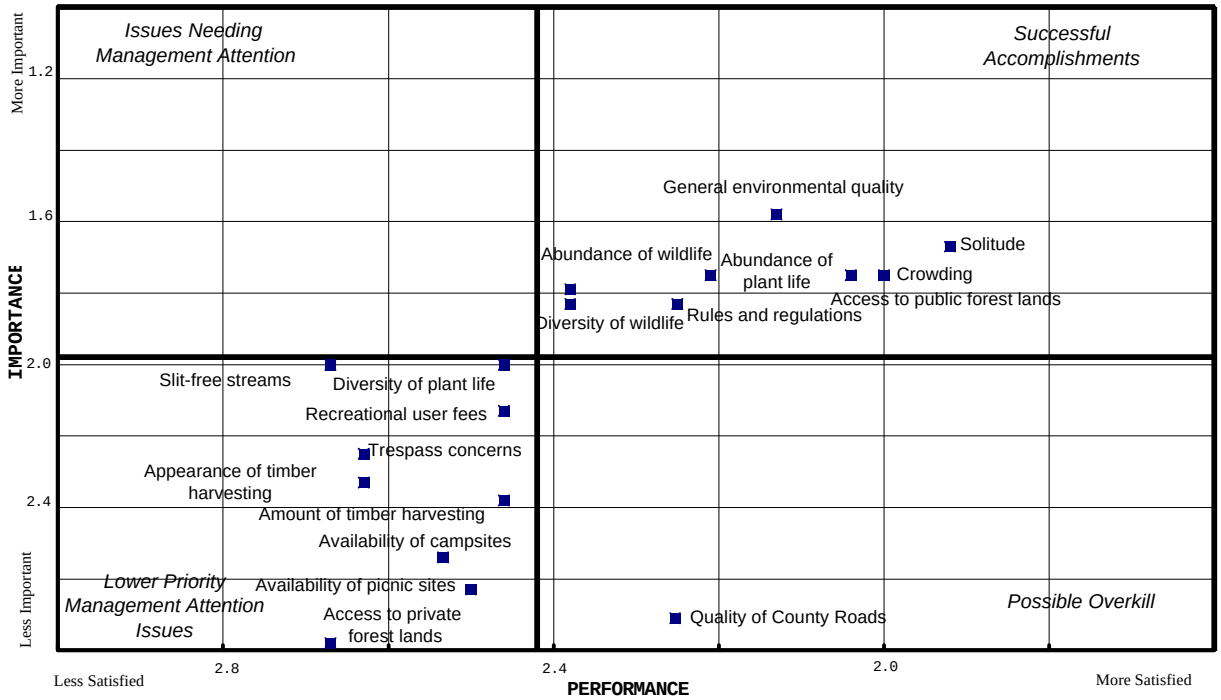

Figure 8-2 Perceptions of off-road bikers.

Horseback Riding

Respondents who identified their primary activity as horseback riding spent their recreation time participating in a number of forest-based activities. These activities are presented in Table 9-1. Wildlife watching, hiking, and fishing were all identified as secondary activities by horseback riders.

The compatibility ratings given by horseback riders are summarized in Figure 9-1. Primitive camping and hiking/skiing received high compatibility scores, while bicycling and motorized vehicle use were seen as incompatible.

Seasonal preferences for outdoor recreation given by horseback riders are summarized in Table 9-2. Summer is identified as the most active time of year by horseback riding participants. Fall and spring are also popular, while winter received a fairly low allocation of days.

Landownership classifications for recreation sites of horseback riders are presented in Table 9-3. Private land and state land were found to be important recreation resources for horseback riders.

Geographic preferences of horseback riders are summarized in Table 9-4. The southwest and the central portion of the state were identified as popular areas for recreation by horseback riders.

Horseback riders provided detailed information describing the recreation spending habits. Due to the small sample size for horseback riders, the spending data cannot be meaningfully interpreted.

IPA measures given by horseback riders are illustrated in Figure 9-2. Horseback riders were found to be relatively unsatisfied with a number of important issues, including access to private lands, crowding, diversity of wildlife, and trespass concerns. They were found to be relatively satisfied with only six of the eighteen issues included in the survey.

Table 9-1. Recreational activities of horseback riders by horseback riding involvement category.

Activity	Horseback Riding Involvement Category (# of horseback riding days/yr.)					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean use	s	Mean use	s	Mean use	s
All-terrain motorized vehicle	.00 (n= 1)	.00	7.50 (n= 4)	8.66	.00 (n= 5)	.00
Off-road bicycling	.00 (n= 1)	.00	.00 (n= 4)	.00	.40 (n= 5)	.89
Camping	.00 (n= 1)	.00	2.00 (n= 4)	2.30	5.00 (n= 5)	8.66
Fishing	.00 (n= 1)	.00	.50 (n= 4)	.57	7.75 (n= 5)	14.84
Hiking	.00 (n= 1)	.00	.00 (n= 4)	.00	13.00 (n= 5)	8.72
Horseback riding	.00 (n= 1)	.00	11.25 (n= 4)	4.72	41.25 (n= 5)	22.50
Hunting	.00 (n= 1)	.00	3.50 (n= 4)	4.04	9.50 (n= 5)	9.54
Pack Animal Use	.00 (n= 1)	.00	.00 (n= 4)	.00	.00 (n= 5)	.00
Plant collecting	.00 (n= 1)	.00	.00 (n= 4)	.00	2.40 (n= 5)	5.36
Cross-country skiing	.00 (n= 1)	.00	.50 (n= 4)	1.00	6.25 (n= 5)	12.50
Snowmobiling	.00 (n= 1)	.00	.50 (n= 4)	.58	.00 (n= 5)	.00
Watching wildlife	.00 (n= 1)	.00	.00 (n= 4)	.00	17.20 (n= 5)	22.12

- indicates no representative cases

Table 9-2. Seasonal incidence of forest-based recreation by horseback riding involvement category.

Season	Horseback riding Involvement Category (# of horseback riding days/season)					
	LOW (0–5 days)		MED(6-20 days)		HIGH(>20days)	
	Mean use	s	Mean use	s	Mean use	s
Fall	.00 (n=1)	-	14.00 (n=4)	13.86	28.00 (n=6)	22.49
Summer	.00 (n=1)	-	6.25 (n=4)	4.50	43.50 (n=6)	14.31
Spring	.00 (n=1)	-	1.50 (n=4)	1.92	22.83 (n=6)	13.88
Winter	.00 (n=1)	-	.50 (n=4)	.58	19.17 (n=6)	11.14

- indicates no representative cases

Table 9-3. Ownership of land used by horseback riding involvement category.

Landownership	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	s	Mean %	s	Mean %	s
Public:						
City / municipal land	- (n=0)	-	.00 (n=4)	.00	1.67 (n=6)	4.07
County land	- (n=0)	-	7.50 (n=4)	9.57	1.67 (n=6)	4.07
State land	- (n=0)	-	40.00 (n=4)	20.21	17.17 (n=6)	15.43
Federal Land	- (n=0)	-	12.50 (n=4)	14.43	7.50 (n=6)	9.87
Public Land (unidentified)	- (n=0)	-	.00 (n=4)	.00	8.33 (n=6)	12.91
Private:						
Private land not owned by the timber industry	- (n=0)	-	37.50 (n=4)	25.00	51.17 (n=6)	44.32
Private land owned by the timber industry	- (n=0)	-	.00 (n=4)	.00	8.33 (n=6)	12.91
Private land (unidentified)	- (n=0)	-	2.50 (n=4)	5.00	.00 (n=6)	.00

- indicates no representative cases

Table 9-4. Distribution of forest-based recreational use by horseback riding involvement category across Wisconsin regions.

Region	Percentage of annual recreational use					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Mean %	s	Mean %	s	Mean %	s
Central	1.00 (n=1)	-	.00 (n=4)	.00	.50 (n=6)	.55
Northeast	.00- (n=1)	-	.50 (n=4)	.57	.00 (n=6)	.00
Northwest	.00 (n=1)	-	.00 (n=4)	.00	.33 (n=6)	.52
Southeast	.00 (n=1)	-	.00 (n=4)	.00	.33 (n=6)	.52
Southwest	1.00 (n=1)	-	.50 (n=4)	.57	.50 (n=6)	.55

- indicates no representative cases

Table 9-5 Annual household recreational expenditure patterns by horseback riding involvement category.

Spending Category	Dollar amount spent for recreation purposes					
	LOW (0–5 days/yr.)		MED. (6-20 days/yr.)		HIGH (> 20 days/yr.)	
	Global $	Local $	Global $	Local $	Global $	Local $
Gas / Auto Service	300.00 (n=1)	120.00	137.50 (n=4)	17.19	1250.00 (n=5)	100.00
Casino	0.00 (n=1)	0.00	75.00 (n=4)	0.00	40.00 (n=5)	0.00
Rec. Equipment	200.00 (n=1)	200.00	40.00 (n=4)	0.00	4320.00 (n=5)	172.80
User Fees	58.00 (n=1)	0.58	57.50 (n=4)	28.75	42.00 (n=5)	5.04
Groceries	155.00 (n=1)	4.65	55.00 (n=4)	13.75	470.00 (n=5)	131.60
Overnight Stays	0.00 (n=1)	0.00	0.00 (n=4)	0.00	0.00 (n=5)	0.00
Licenses	15.00 (n=1)	15.00	30.00 (n=4)	0.00	76.80 (n=5)	46.08
Recreation	40.00 (n=1)	0.00	25.00 (n=4)	0.00	800.00 (n=5)	64.00
Restaurants / Drinks	70.00 (n=1)	0.70	100.00 (n=4)	0.00	435.00 (n=5)	121.80
Other Retail	20.00 (n=1)	0.00	25.00 (n=4)	0.00	6.00 (n=5)	0.00
Property Tax	0.00 (n=1)	0.00	0.00 (n=4)	0.00	1000.00 (n=5)	200.00

- indicates no representative cases

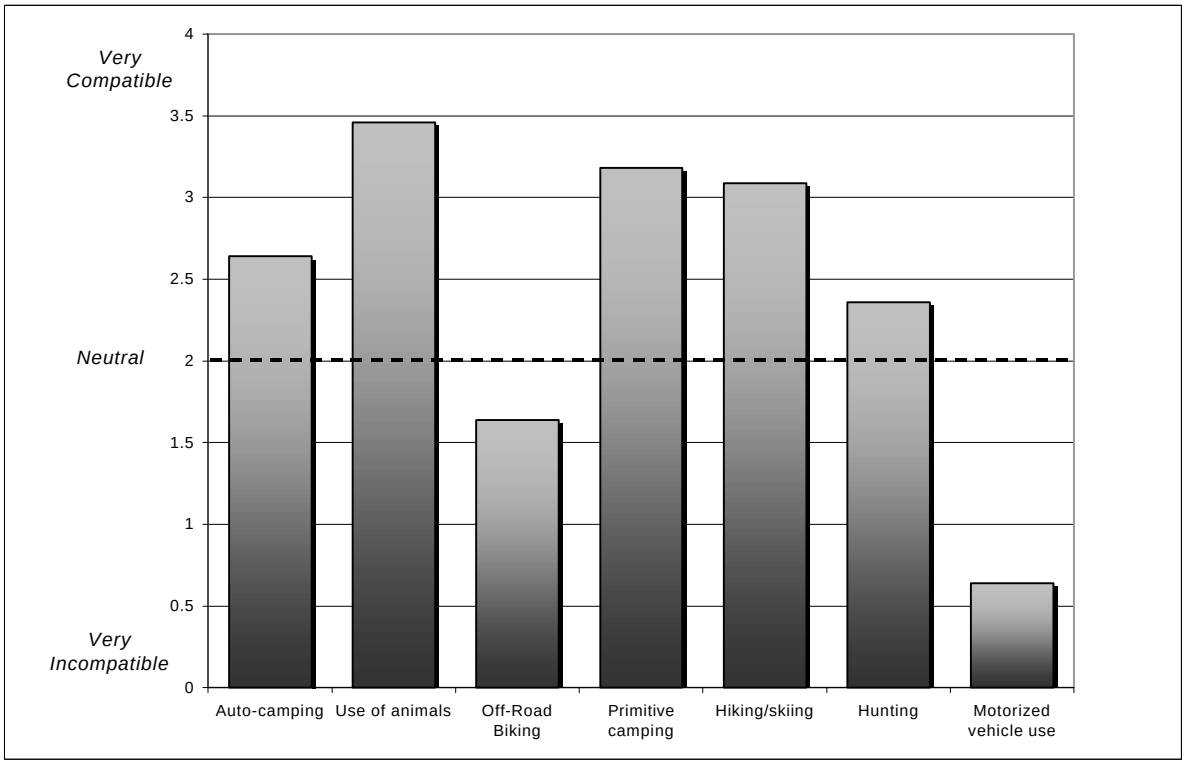

Figure 9-1 Compatibility of horseback riding with seven activities.

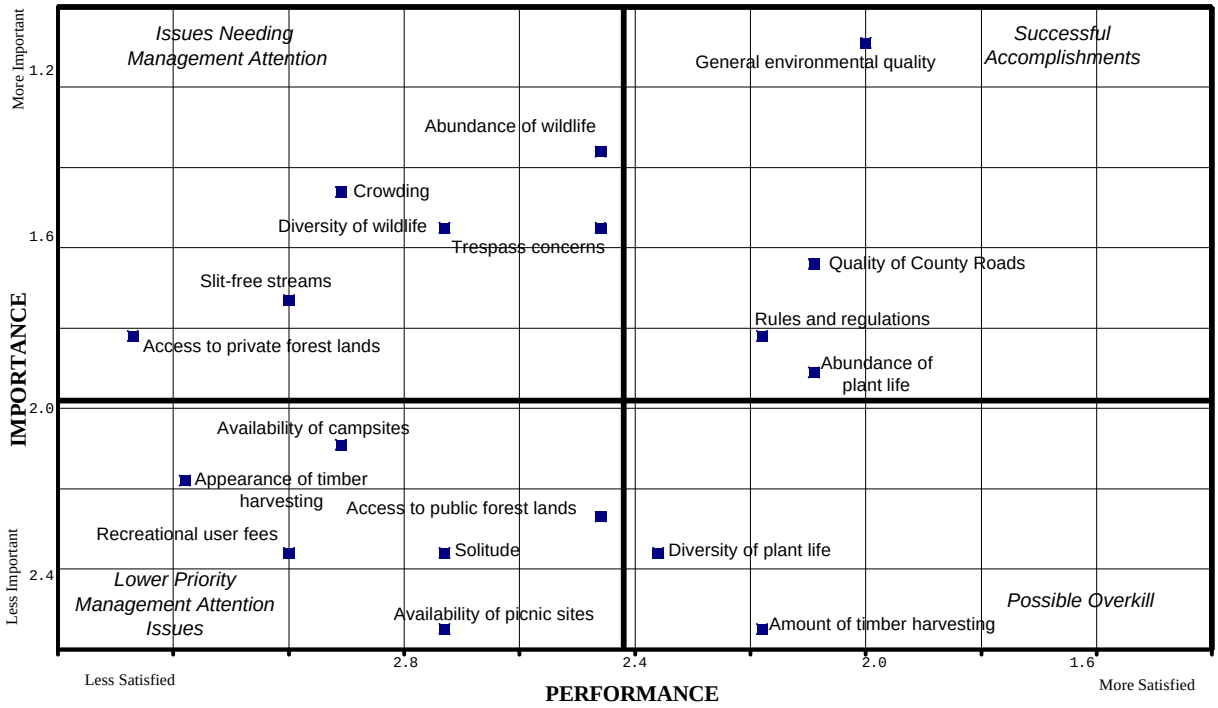

Figure 9-2 Perceptions of horseback riders.

Cross-Country Skiing Too few responses were received by Wisconsin residents who identified cross-country skiing as their primary activity to allow for summaries like those presented above. However, cross-country skiing was a prominent secondary activity for both hikers and campers. By inferring from the responses provided by these groups, one could possibly draw conclusion about the habits and concerns of cross-country skiers. For example, both groups identified state land as an important recreation resource. It is likely that state lands are also important resources for cross-country skiers.

Plant Collecting No respondents identified plant collecting as their primary outdoor recreation activity. Hikers were found to be most likely to identify plant collecting as a secondary activity. It is difficult to determine what relationships can be drawn between plant collectors and hikers. It is likely that the two activities take place simultaneously as hikers take to the woods in order to collect plants. Policy management intended to meet the needs of hikers would potentially aid those hikers who collect plants, so long as their target resource (ginseng, wild mushrooms, etc.) remains intact.

Pack Animal Use Only one respondent claimed to have used a pack animal in Wisconsin in the year of the survey.

Appendix B


NORTHWEST UNIT
NORTHEAST UNIT
CENTRAL UNIT
SOUTHWEST UNIT
SOUTHEAST UNIT